How to explain yourself better

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Executive Summary

I have now taught enough students and on enough different topics to have some opinions on the components of a well-explained answer. I have also seen enough bad answers to note some patterns. These notes represent an attempt to organize my thoughts to enable willing students to do better by not doing badly. To summarize: I think that a student can find more reliable conclusions if their answers make connections, clearly and consistently, often with the intent of making a comparison.

These notes differ from what would be found in a 700 page textbook in two ways. First, they do not focus on the specific content of a class. Second, an appendix discusses the 10 styles of answers, plus variants, which annoy me when I read student answers. I note why it is possible to do better and I argue that the benefits of doing better are not limited to my class or to one's time in university. To show how these ideas work in practice, a second appendix takes one commonly-asked question and discusses over 40 weaker answers.

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* My thinking on this issue has evolved over the years following conversations with many students, faculty members and others. Their help is greatly appreciated. Further comments would be welcomed as part of the discussion which forms a common thread in all good explanations. Contact information: panglin@uoguelph.ca

Introduction

I spend my class time lecturing, asking questions and answering questions so that students will learn new ideas and explore the limits of old ideas. I also ask questions in the form of tests and assignments and I expect students to provide the best possible answers. Some students offer the "right" answer, while others demonstrate their confusion. While I encourage students who get the right answer to find better answers and I encourage confused students to find the right answer, these notes do not focus on the differences between right, wrong or confused answers. These notes focus on being able to explain any answer, about why giving an explanation may be more important than the answer itself and about why attempting to give a more complete answer would help most students.

It seems to me that enough students can learn the content of a course, at least superficially. They can identify the appropriate vocabulary. They can remember the classic answers to typical questions, mention the important methodologies of analysis and are able to name the important theories. While such knowledge may be adequate to pass a course, this approach to learning views knowledge as static collection of (more or less old) facts. A dynamic perspective reveals that knowledge is a way of thinking or of discovering new facts. Knowing the vocabulary of a course does not guarantee that the student can transfer knowledge to a new context or that the students can integrate multiple perspectives into their thinking.[1] While instructors can teach the content of a course, and history has shown the usefulness of that content, the student must supply the extra spark in order to progress to the next level in the future.

It seems to me that the reason for this disconnect between content and application is that a distressingly large number of students do not know how to give a good explanation. While the cause may be overuse of multiple choice tests or too little exposure to the real world, I think that the solution is common. This solution is evident in my comments on the test papers of many students asking for a more complete explanation or asking for *why* they think their assertion is correct. Even in informal classroom discussions, I ask questions and some students give answers that are so short that I have to follow up by saying "… because …" and wait expectantly.

[1] As one college course outline notes, an "Essential Employability Skill" is the ability to "*reframe* information, ideas and concepts" to demonstrate understanding (emphasis added).

The material below is addressed to such students and is divided into a couple of sections to look at different parts of this puzzle. The first part says why I think that a simple statement of an answer, even if it is the correct answer, is not good enough for full marks. The second part indicates what I believe to be the defining characteristics of a good explanation: connections and consistency. Sometimes, a good explanation uses connections consistently because it makes a *comparison*. The final section gives some other advice on how to do better on my tests and why this advice should help you after you leave my class or the university.

These notes cover many pages because students can convince themselves of many reasons why an answer does not need to make connections or does not need to be consistent with other aspects of their education. The consequence is that the answer is wrong or unreliable and they get a low grade on a test or assignment. These notes are long because, to demonstrate that the summary is correct, I include two appendices. The first appendix applies these ideas using 10 styles of answers that I do not like:

A/ Superficiality and Platitudes

B/ Buzzwords™

C/ Repetition

D/ CYA

E/ More than one right answer

F/ Another alternative is also good

G/ Humpty Dumpty

H/ Pros and Cons

I/ The Scarecrow (from the Wizard of Oz)

J/ Arithmetic

Some styles I do not like under any conditions. Many of the styles have disguises or variants that are more interesting or useful under some conditions. And some styles are listed because, while not entirely bad, the style can be polished to better fulfill the excellence expected of a grade A explanation.[2] Mostly, this appendix is long because it gives short examples and discusses how an unconvincing style can be converted into something more convincing.

[2] "Excellent: An outstanding performance in which the student demonstrates a *superior* grasp of the subject matter, and an ability to *go beyond* the given material in a critical and *constructive* manner. The student demonstrates a high degree of creative and/or logical thinking, a superior ability to organize, to analyze, and to integrate ideas, and a *thorough* familiarity with the appropriate literature and techniques."
(http://www.uoguelph.ca/registrar/calendars/undergraduate/2009-2010/c08/c08-grds-proc.shtml emphasis added)

A second appendix takes one common question and discusses over 40 answers but commonly seen on tests. All but one of these answers is weak. This discussion is long because the comments show how a weak answer to this one question is connected to a wider range of more important issues in a range of courses, or how a weaker answer could be made into an A answer that would reveal even more. This appendix aims to offer constructive criticism while reinforcing the idea that giving a better explanation has effects other than raising the grade on one test in one course.

These appendices are much longer than the main text for several reasons. First, because many of the ideas are repeated many times to demonstrate that many problems have a common source. The repetition is necessary in this static document that is read by people with a wide range of specific issues; it could be shortened to only those sections which are most relevant if I knew which type of student was reading it. The length is also a consequence of the fact that the discussion must introduce an idea in some detail and then, without using too much mental technology that is specific to one course, show why the idea is not as good as it seems. Some of the topics being discussed are related to bigger issues that a student may overlook during their attempt to pass a course or to get a grade which is high enough to earn a scholarship; when suitable, these discussions are put into a longer footnote.

Do more than state the answer

Every test question is looking for an answer but there are many reasons to do more than just state an answer. If you believe in incentives then, perhaps, the best reason to do more is stated near the top of every test that I prepare: *Marks will be awarded based on the clarity and content of your explanation of your answers.* Other reasons include:

1/ By going beyond a simple statement, you give yourself an opportunity to demonstrate your judgment and your insight. You can show your boss that you have thought of what he or she is worrying about but did not say explicitly. You can show your boss that you have earned enough trust to be promoted to the next level.

2/ Many employers are looking for employees with good communication skills and good problem-solving skills. If you cannot think through a problem carefully, completely and consistently, then you cannot explain, communicate or solve it very well.

3/ Most important questions have been the subject of many long speeches and have been the subject of multiple books (with apparently opposing answers). If that is true, why do you think that an answer with one or two paragraphs could ever be sufficient?

4/ You should not assume that I will always agree with you. Regardless of whether I agree with you or not, if you think that "downside risk" is important then you should plan for me to disagree with you.

5/ In the real world, some things are not known and you need to clarify the question. In a test, you need to identify the planning assumptions and clarify which parts of the analysis are most sensitive to those assumptions. In the real world, this skill helps because you can ask for input from advisors without wasting too much of their time.

Ultimately, you should remember that any statement which "convinces" only those who already agree with you is not a very effective explanation. To use an example from business, consultants are hired to give an answer but they are graded (i.e. rehired or able to charge a higher hourly rate) based on their ability to explain why their answer is a good one.

Giving a short answer may satisfy the strict interpretation of answering a question but giving a short answer rarely satisfies the university's definition of what constitutes "Excellence" in a student. Giving a minimal answer does not encourage a professor to give a letter of recommendation with anything more forceful than "This student filled his/her assigned space in my classroom."

I understand that there is a time constraint in a testing situation and that you need to decide how to allocate your time.[3] This concern applies in general to all students but it is relevant only to students who do not leave before the end of time. Giving an explanation can be hard and time consuming. It is made harder and more time-consuming if you did not learn what we anticipated that you should have learned in the previous course (i.e. that boring pre-requisite course in which you skipped more than half of the classes). Answering questions in the next class will be harder still if you do not learn what you are expected to learn from this class.

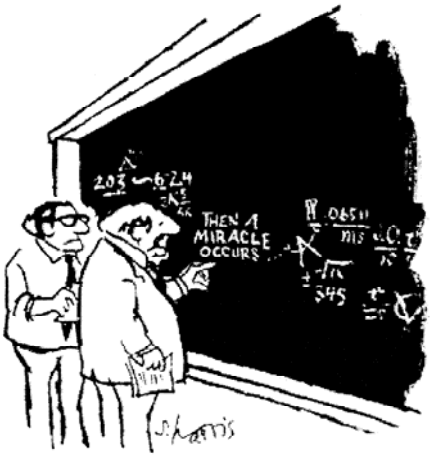
[3] Many professors understand the time pressures on students and are willing to let students skip class based on the idea that you have chosen to spend your time to your best advantage. Since one of the consequences of skipping a class is that you will be less prepared for the test, it is also true that the same adult expectations which allow professors to not care about class attendance also implies that they do not care if such students do poorly on tests and assignments: if you have been using your time to your best advantage and still cannot display what you know, then it is not the professor's fault.

Finally, since time constraints are a fact of life to all non-students in the real world, especially if you want to work in a job defined by deadlines, why should we make an exception now?

Fortunately, the five reasons above do not tell you how much to write but what to spend your time writing about. In general, the level of discussion and the connections which need to be made are discussed during class time. Even for questions which are numerically oriented, you may think that the answer, or the calculations needed to find the answer, is sufficiently obvious that it is enough to state the answer. This thinking is dangerous since I find that the arithmetic skills of too many students are too weak to make this thinking reliable. Or, you may think that there is no clear answer and that I am looking for your opinion. I am not interested in your opinions for the same reason that you are probably not interested in my opinions; I am more interested in the process that you use to reach that opinion/conclusion. And, if you imagine that opinion does not rely on facts or logic then your opinion is unreliable.

What constitutes an explanation?

At its most fundamental level, a well-known cartoon shows why a good explanation needs to connect ideas.[4] A good explanation makes these connections in ways that are clear and consistent. It inoculates you against the logic fallacy of *post hoc ergo propter hoc* (Latin for "after this therefore because of this"). In contrast, a bad explanation may be a simple statement without any connections. Or, a bad explanation may depend on *ad hoc* fixes which, like magic, appear out of thin air without context and only if needed to justify an (pre-determined? wrong?) answer. This kind of ad hockery is especially dangerous[5] when making a comparison, and comparisons are an essential feature of any decision.



"I THINK YOU SHOULD BE MORE EXPLICIT HERE IN STEP TWO."

Some students may think that this definition of an explanation makes their life more difficult because the connections to be learned become more complex as the student progresses

[4] Copyright © 2006 Sidney Harris. No reproduction other than for personal enjoyment without written permission
[5] The four most dangerous words in research are "This time it's different".

through the education system. At a university, it may seem even worse since a student is taught by people who are experts in their fields and these experts rarely talk to each other in a way that produces one cohesive story for students: different professors think that different types of connections are most important. (And I am no different.) Fortunately for you, the value-added of being at a university is to be exposed to new ideas, to allow you to combine them and to go beyond what any one professor tells you. Further, these notes do not focus on the choice of connection being used, since that is the subject of a particular course, and do focus on the lack of connections displayed by bad answers.

I started the previous paragraph by noting that my definition of an explanation seems to make life more difficult but the added difficulty is only superficial: most undergraduate students do not see the process of arguing about the connections between different ideas that professors use within a single discipline. Professors use this process amongst themselves to generate and verify the new ideas that will appear in future editions of the textbook that you just paid $200 for. The fact that different disciplines consider different types of connections as more important does not make my argument invalid. For example, a psychologist may consider habit formation or framing to be an important determinant of behaviour. A sociologist may consider peer group effects to be important. An economist may think that prices and income are important. A computer scientist may view the human brain as an advanced calculator. The different disciplines tend to ask different questions and these differences lead to answers which require you to use the ideas which are special to that discipline. It is also true that these differences need not be mutually exclusive.

I think that the key to generating and verifying any new idea is the same as confirming any old idea: finding the connection between the question and the answer. Many questions are interesting and many answers are interesting but, when marking, I am interested in knowing whether an answer is connected to the question that I asked. As noted below in my discussion of bad styles of answering, weak answers use obscure or non-existent connections. If the connections are weak or obscure both in the answer and in the writer's mind, then the student is missing important lessons.

I think that connections are interesting because no idea is completely isolated or has only

one application. The process of arguing and making connections shows why ideas that are true in one place and place can be expected to be true in other places or at other times (or can be expected to not be true). Seeing connections is also important because an explanation almost always creates subsidiary or complementary implications. For example, if consumer tastes change, consumers may buy less of your good but that action is connected to other actions: e.g. Are consumers buying more of some other product that you sell? Do consumers buy less because of a competitor's strategy or a change in taste for all brands? Are there any implications for government policy? Knowing these implications can help you investigate when the available information gives a confused picture. Even if it is too late to find confirm or investigate these implications, thinking about these questions now is a good way to prepare for next time when it would not be too late. Learning to connect ideas is an especially good use of time for a university student who will be expected to *quickly* find answers later.

In classes which emphasize concepts, the value of explaining the new concepts on a test may seem more obvious but giving an explanation for an application is equally valuable. Consider "Break Even Quantity" (BE). This measure is taught, despite the fact that many teachers can give long lists of reasons why the measure is not very good, because it is widely used. The formula is simple (BE= FC/(p- c) where FC is the fixed cost, c is the marginal cost per unit and p is the price of output), is intuitively appealing and is taught in many classes in many different departments. So, why do a distressing number of senior, smart, hard-working, practically-oriented students become confused on this easy and practical, question? I think that the reason is because if a student knows the right answer then they know the right answer. Unfortunately, a student who relies on their memory and thinks that they know the right answer or formula (but does not) does not take the extra seconds needed to check whether the formula was memorized correctly. A student who is learning new ideas all the time cannot be entirely sure of whether they are the first or second type of student, especially if under pressure. Many other formulas can seem right even if the variables are limited to FC, c, and p.

(FC/p)- c	(FC- c)/p	FC- (p/c)	FC/p/c
p- (FC/c)	FC/c	FC/p	c/p
p/c- FC	p/(c- FC)	FC/(p+ c)	p/c

In a specific industry, the basic formula may be modified according to the special features of that industry or if the information is present in a format which uses more than the three numbers

corresponding to FC, c and p. None of these 12 formulas are of much use if you memorize the right formula and cannot adapt to a situation where the data are given in a different format, such as "GC= 101.3, k= 3.2, z= 5.736", but you could figure it out if you knew that you were looking for the quantity at which total revenue is equal to total cost.

Taking the small amount of time needed to write out an explanation[6] avoids many serious mistakes; as noted above, a good explanation is a form of self-insurance. The same argument can be applied to other definitions such as Total Revenue (= price* quantity) and Profit (= Total Revenue- Total Cost). These definitions should be almost obvious when introduced in an Introductory class but I have had senior students come to my office asking for help (*after* pondering their assignment question for many days). The definition was obvious but, in their rush to get to a numerical answer, the students did not recognize that they were using the wrong definition or became confused because the information was not presented in the same format used by the multiple choice question they passed in the Intro course.

I think that the second characteristic of a good explanation is consistency. In a business context, most jobs involve repetition and, since anybody can be lucky once or twice, long term success depends on using a good process over and over again. This characteristic may be unfamiliar to students because they rarely do the same thing more than once or twice in a course. Next year's students will be asked different questions but the content of the course is not a particular question or answer; the unchanging content of a course is the learning process which enables you to link the kinds of questions and answers identified in the course description. Since you are rarely asked exactly the same test question twice, a good education aims to give you the tools and the flexibility to look at a wide range of possible questions and, when asked a similar question, recognize that the answers will also be similar. Special cases occur and the answer may change but a good education enables you to distinguish a truly special case from the mass of

[6] That is: "BE represents the quantity such that profit equals zero: i.e. total revenue equals total cost. Since total revenue= p* Q and total cost is FC+ c* Q, Q must satisfy p* Q= FC+ c* Q. Hence, p* Q- c* Q= FC. Hence, (p- c)* Q= FC. Hence, the only solution for BE is Q= FC/(p- c)."
This arithmetic contains various behavioural assumptions which your instructor may comment on. More significant is the fact that many students object to some of these assumptions (in a different context when they are stated explicitly) but, because they do not know why the formula is relevant, do not recognize their application in this context.
Even when using the right formula, simple computation errors are sufficiently common that, as further self-insurance, it is a good idea to estimate the profit implied by your estimate of BE.

ordinary cases.

Maybe a student goes directly to the answer, and skips over the part about giving a good explanation, because he or she is in a hurry to get to the fun stuff. Developing a social marketing campaign that will go viral, implementing an activity-based cost (ABC) system that will cut costs by 25 percent, or repositioning an orphan product can be exciting to somebody who has spent most of their life in a classroom. But the cost of skipping over the boring stuff appears later when your brilliant strategy is ineffective because you failed to recognize some aspect of the situation. George Stalk of the Boston Consulting Group in Canada advocates what Ohno[7] calls the practice of the "Five Whys". In their opinion, the first answer to a question "why did __ happen?" rarely uncovers the root of a problem. That answer to one question becomes the basis for a deeper question which eventually reveals a question whose answer can become part of an operational strategy. Sometimes, asking "Why?" five times suffices and, sometimes, it is necessary to ask "Why?" more than five times. Thus, one of the reasons I expect to see explanations on a test is to enable you to discover when something important is missing from what you are told about the real world.[8]

Getting in the habit of giving an explanation is useful because you will not suddenly become smarter, more eloquent or more convincing just because you leave university. It takes practice to be able to convey a complicated idea in the shortest possible time or fewest possible

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[7] Stalk, G., 2008. "Why?", *Globe and Mail*, May 5, p. B10.
http://www.reportonbusiness.com/servlet/story/RTGAM.20080501.wstrategystalk0505/BNStory/robAtWork/home
Ohno, T., 1978. *Toyota Production System*, Productivity Inc. New York (English Translation, 1988).
Tim Bray's "The Law of Explanation" discusses who bears the responsibility for clarifying a misunderstanding or a confusion in business (http://www.tbray.org/ongoing/When/200x/2004/01/13/LawOfConversation). This discussion may be especially relevant since Mr. Bray was instrumental in developing the software which revolutionized the way that information is made available and exchanged (using the Web) without necessarily changing how raw information is processed or used by decision makers.
Both of these citations should reveal to a naïve student that being explanations are common in business because confusion is common, regardless of the kinds of technical competencies typically emphasized in a classroom.

[8] It is important to be curious in the real world because, with the right preparation, curiosity can lead to unexpected answers. Pasteurization, penicillin and Viagra were all discovered by people who combined a curiosity about how many things worked with an ability to recognize when something was sufficiently unusual to recognize an unexpected outcome and to seek a better explanation. Without the right preparation or if self-motivation does not replace the continuing flow of new ideas stimulated by an instructor, every problem looks the same: as indicated in the platitude "To a hammer, everything is a nail".
In a static sense, curiosity represents a cost with few immediate benefits. But innate curiosity is often a dynamic competitive advantage. This kind of curiosity distinguishes the science that most people remember at high school from the capital-S Science advocated at universities: it is the difference between learning a *collection* of isolated facts and conclusions that may change in the next edition of the textbook and learning a *process* of discovery.

pages. Students know this fact from the number of job applications that produce no interview and the number of interviews that produce no job. After getting a position someplace, it is also worth mentioning that your audience will have much tougher questions than a professor would. Some of this toughness will be due to a diversity of their backgrounds, biases and pre-judgments which you must respond to if you want to convince them. Plus, your audience will expect more detailed answers. And, unlike professors, your boss will not be paid to read what you write just because you wrote it.

I think that having the habit of explaining is part of the university's job of turning you into a life-long learner. Many of the ideas that you will use during your life are ideas which professors know (and do not teach you) or are ideas that they do not yet know. By trying to provide detailed explanations now, you can teach yourself about these gaps and you can develop the kinds of innovative ideas that nobody has yet thought of. Or, by taking the time to explain it to yourself, you may learn a lesson that is familiar to people with more experience: that somebody is always claiming that the rules of business have changed because of ___ and that, later, everybody realizes that the New Rules are just the Old Rules repackaged.

Advice on how to not lose marks on a test or assignment

The appendices identify many different bad answers and reading them can be depressing because everything seems to be a mistake. But, before you get too depressed, remember that not all comments apply to you and that not all disagreements between professor and student mean that the student is wrong. Some of my lectures notes are based on the ideas and arguments made by students in previous years. Further, professors were students and professors have the advantage of now making their mistakes in places seen by few students.

I have other bits of advice that may help make the connections that I am looking for.

- Do not build a castle by starting the foundation 10 feet above the ground: start with what you know to be true, such as facts, definitions or planning assumptions. Doing so tells me that you know what is important, even if you do not yet know exactly why it is important. Doing so also opens the door for the kinds of longer discussion that can be done more easily in a work place amongst a smaller group of people.

A test question may, in your opinion and as also happens in real life, omit some things

that would be useful. Your ability to recognize an embedded assumption, and its role, is an important research skill and job skill. Some statements may be "uncertain" in the sense that something important is missing and part of what I will be looking for in a good answer is to see if you would know what to look for to determine whether the statement is true or false.[9] If you feel that something important has been omitted then, with two restrictions, you may add assumptions. The two restrictions are that

1/ you may not assume the conclusion that you are being asked to explain and

2/ you may not contradict any information that was provided in question.

In some cases, these assumptions may have no real effect on the answer but may clarify the problem in your own mind. Better answers use more fundamental and more general assumptions. Hopefully and with time, you will learn to generalize your argument and to distinguish the important things from the details.

- If your answer on a test becomes confused because you changed your mind concerning which answer is correct while writing, then please end your answer with a summary sentence or paragraph to convince me that you do know what is important but do not have enough time to make it look pretty.

- Point form answers are usually acceptable on time-limited tests, so long as all of the relevant points and connections are included. That being said, the grades on longer projects, such as case reports or essay, will be affected by bad grammar. This effect is usually for patterns of mistakes, not for isolated mistakes, and is imposed for relevant reasons discussed in class.

- Especially for case analysis: stick the "obvious stuff" in an appendix if necessary but *stick it in there* because it may not be obvious to everybody or to anybody else.

- Don't focus on memorizing. You may memorize the wrong things.

Memorizing definitions helps, for the same reason that knowing a vocabulary helps you to understand a new language. It also improves your chances of doing well on a multiple choice style test. Definitions help clarify the problem but, as noted above in the context of BE, TR and profit, knowing the vocabulary is only the *starting point* for the kinds of problem-solving expected of advanced classes. For example, I am surprised at the number of students who can

[9] You can criticize an assumption but this approach to an answer is not as easy as it sounds. You may cite data, but your argument should be prepared to respond to somebody who asks whether the data is convincing for reasons discussed in various classes in statistics or research methods. Or you may connect the assumption to some other behaviour. Ultimately, the question to be answered is: does changing this assumption make a big difference or a small difference to the answer? Would using a different assumption change a "Yes" into a "No" or would it change the answer from 10.31 to 10.29?

define complex ideas such as “marginal cost” and “fixed cost” but, during a test, will say “cost falls” without understanding that their answer depends on whether fixed cost or marginal cost falls.

- Related to the point about memorization and for several other reasons, I encourage you to not study late at night before a morning test. First, there is the problem of diminishing marginal productivity. Second, if you are too tired to understand what the question is asking, then it does not really matter what you memorized during the night before. This idea is especially relevant for questions which ask you to apply concepts in a way that is slightly different from what was discussed in class. Third, and as a lesson in sequential planning, you are rarely “forced” to study at 3:00 am: if it appears that the only time available for studying is at 3:00 am on the night before then you need to think about the connection between studying at 3:00 and how you spend your time on other days.

- (This advice may be more relevant when studying) Do not be satisfied with a simple answer even if it seems valid. For each simple answer, a more detailed answer may give more insight on how to do even better. Further, even if you can find one answer, other answers may also be possible and, to prepare for the real world, you should be trying to recognize as many as possibilities before picking one. Finally, with an understanding of “downside risk” and the tendency for people to deceive themselves, there are benefits to planning for your audience to disagree with you.

- Learn to give constructive answers. Disagreeing for the sake of disagreeing shows only that you think everybody else’s answer is not right. For example, instead of saying that “The forecast is wrong because it is based on the wrong level of income”, note that “The forecast is wrong” and note how the forecast could be improved.

- Do not let your grade depend on the presence or absence of one word. I read answers, and am willing to give the benefit of the doubt to my interpretation of what you write, but I have other things to do with my time than read (especially if the handwriting is unclear). By giving a minimal answer, you run the risk that I overlook that critical word or that I do not see enough substance in the rest of the answer to warrant giving you the benefit of the doubt.

- You can ask me to clarify what is being asked. Sometimes, students think of unusual cases that I never considered or, especially in the case of students for whom English is not their first language, a word may be unclear or be unfamiliar slang. In such cases, I may clarify or I may say “you should know that” or I may say, “The point of the question is to help me

understand if you understand what difference it makes." If all else fails, and you think that X is important, see the first bit of advice: state clarifying assumptions. On a job, you and the boss can discuss how to refine the assumption or where to find evidence to support or reject it.

To emphasize what has been said many times here, it is the connections and the building of an argument toward the conclusion that is important in a learning environment: your answer on next week's test will not save anybody's life or make anybody rich. That occurs later, if you learned enough.

Beyond giving more complete explanations on a test, I encourage you to get in the habit of giving an explanation, even if an idea seems obvious. For the first many times that you try to explain some simple idea, you may find that it takes a lot of time and space. This is normal since it takes practice to become good at anything important. I tend to use the following simple test to define whether an idea is obvious: can it be explained in one or two sentences? If Yes then it takes very little time or space on a test. If No then it is not as simple as you expected: the one or two sentence version leaves out ideas, or special cases, that should be recognized (in spite of my warnings concerning style D2 in the appendix).

I am not looking for you to say what I want to hear; that is the trick used by consultants. I do have a preferred answer, which I spend time in class trying to convince you of why it is a reasonable answer, but there are many ways to explain it. And I am looking for excellent students to go beyond the preferred answer and to surprise me. The argument, as well as the answer, is valued. I am willing to give full marks to somebody who says "Yes because ..." and to somebody else who says "No because ..." if both identify the relevant bits following "because...". Later, when your own money is at risk, you can worry about the answer more than the argument. At that later time, you may also find that the same explanatory skills are needed to convince your co-workers or your board of directors to use their time and effort to help you.

Is it just my opinion about what constitutes an explanation that is "good enough"? It is certainly my opinion, since I am giving the grade, but it is not mine alone. Further, in my opinion of myself, I am fairly flexible on the conclusion. Within limits, I am willing to give you the benefit of the doubt concerning an interpretation of your writing. I always accept discussion

after handing back a test or assignment, even if I do not agree with you in the end. Usually the thing that I think is missing from your explanation, especially if many marks have been deducted, is something that I consider important. I can usually tie this important omission to a real life example. So, this opinion is not just temporary or mean-spirited. If you think that another professor would give you a different grade, you may be right. But, you might find that the basic building blocks of their explanation are the same as the basic building blocks in my explanation and that they were not a part of your answer.

Ultimately, and this is annoying to some university students, an answer that was acceptable in a first year course may not be acceptable by the time of graduation. In graduate school, a simple answer would be unacceptable because you are expected to see distinctions that were too small to worry about in an introductory course. I think that what is most annoying to a university student is that they are leaving the safety of knowing that a right answer can be found somewhere, on the Internet or a book, if you look for it long enough. As you learn more, you learn that those direct answers should be more nuanced. Some students seem to take this lesson incorrectly to mean that all possible answers are wrong (see D2 or H in Appendix 1) but, after you leave university, you will learn that promotions are earned by offering your own answers and not by showing that everybody else's answer is wrong.

At university, you are learning even more nuances but you should also realize that knowing these nuances tells you how to ask better questions. For many people, university is their last bit of organized education even though most of their lives will be lived under conditions that are very different from the recent past.[10] The answers to today's questions have an uncertain best-before date. The ability to solve problems and to explain those solutions to a wider audience does not have a best-before date.

[10] To people who think that business competition is based on the laws of Darwinian evolution and "survival of the fittest", I remind you that Darwin's advice was that the fittest are those who adapt to an environment quickest.

Appendix A: Bad Styles of Answering

Why they are bad and how to do better

The comments below discuss 10 styles, plus some variants, of bad answers:

A/ Superficiality and Platitudes
B/ Buzzwords™
C/ Repetition
D/ CYA
E/ More than one right answer
F/ Another alternative is also good
G/ Humpty Dumpty
H/ Pros and Cons
I/ The Scarecrow (from the Wizard of Oz)
J/ Arithmetic

The comments also discuss reasons why I consider them unconvincing. The part that may confuse you is that many of the styles are not entirely bad. For this reason, some comments suggest a better alternative.

Note: When I re-read these notes, it seems to me that I am being a bit harsh. Readers should remember that some students give consistently good explanations and most students can give a good answer occasionally. I want to encourage you to do better and to be more consistent. My harshest comments are aimed at "repeat offenders" who consistently fail to make consistent connections. The examples below are stated more bluntly than any student would do (but only a little bit more bluntly and because bluntness saves space). Further, since many different people may read these notes, it is probably true that only few of the styles of examples apply to any one person. If you see yourself falling into one of the bad styles then please try to change it.

A/ Superficiality and Platitudes

In response to a question that involves business conditions, examples of bad answers include: "business is fast paced now", "flexibility is essential" "the world is changing fast because the environment is changing with increasing frequency" "we need to improve quality", or "the competition is savage". Yes, I agree that the world is probably faster, more complex and demands more flexibility now. But these statements do not prove it: In what *sense* is the pace fast? Is flexibility equally essential in *all* industries? Which *aspect* of the environment is changing? Is there any *alternative* to improving quality? Do you mean "savage" like lions chasing zebras on the African plains?

These bad answers are vague in the sense that they do not indicate the kind of clearly defined events and processes that would lead to specific effects. These statements do not convince me because the same concerns were raised by others, who were in the same position that you are in now, 10, 20, 30, 40 and 50 years ago.[11] And I think that this list of changes to the current environment is too short.

A useful characterization of a platitude is that if you can replace some descriptive element (e.g. name of a product, company or industry) with some other product, company or industry and the comment continues to make sense then the platitude is not connected to the facts

[11] And, if the business conditions were relatively favourable at the time that the textbook was being written then the author can say the same thing by warning about the dangers of complacency or by noting formerly successful companies that have vanished. Even in the incredibly profitable world of computer development centred in Silicon Valley during the mid-1990s, a book written by the CEO of Intel declared *Only the Paranoid Survive*. So, what is the real difference?

of the case. Platitudes have little value because, for every platitude, there is usually another platitude advocating the opposite conclusion: e.g. "haste makes waste" or "Through perseverance [not flexibility], many people win success out of what seemed destined to be certain failure." (Benjamin Disraeli). A good explanation displays a deeper understanding by offering a constructive answer or by recognizing what is special to a particular situation since many things are true on average but you are not an average person and are not going to work for an average company. This need for a deeper understanding is especially significant since a deep knowledge of platitudes would not prepare you for worrying about balancing costs vs. the benefits.

I am trying to teach you a broader perspective, and, if such comments were made by somebody else during a case discussion, it would be a good idea to question the applicability of the platitude by offering a counter-example.

A1/ Weasel words

A variation on the idea of superficiality, that also sounds important until it is read carefully, is to use a word which *suggests* a conclusion. Common examples include

"reasonable" as in "a reasonable person would buy more" or "it is reasonable to assume that I am smart"

"(good) enough" as in "we do not need to increase the price because we are making enough profit" (to whom? in what sense?)

"affordable" as in "consumers cannot afford to buy" (but, if the price increases, then we would really like to know whether the consumer reduces consumption of this good or reduces consumption of another good to pay for the price increase of the more valuable good, or some other solution.)

"fair" as in "This price is fair" (to whom? in what sense?)

"probably", "may" or "might" are often used when somebody cannot identify or state conditions which would make something true or false. Unless you are asked to do a statistical analysis, these words are especially weaselly because it is equally valid to say "X is probably true" and to say "X is probably not true."

These examples show how the words appear to justify the conclusion but are not connected to anything else. The samples above make the words seem even more disconnected because you do not see the question that they are supposed to be connected to. Politicians use this kind of language to make grand statements without actually saying too much that is specific.

A2/

Some answers conclude that "X can't be done" without saying exactly why X is impossible or the conditions under which it is impossible. Expanding your ideas of what is possible is part of the learning process and my usual response is to show how X can be done. It would be better for you to explain why X cannot be done and that may reveal your own use of an implicit assumption. Or, after I read you're the explanation of the conclusion, I may see that the wrong conclusion is based on the misuse of a minor assumption and I would deduct fewer marks. Finally, I would remind you that some people think the key to success in business is to break a rule in an *interesting* way.[12]

A3/ "X is important because most companies worry about it"

Even if most companies are worrying about it, you do not work for most companies.

[12] A practical variant of this style is used in business when somebody dismisses an idea by saying "It's been tried before." The frustration and disadvantage of a rookie is that they do not know what has been tried before. The usual defence against such dismissals is to say either that "It has not been tried before *this way*." or "The conditions have changed." In either case, a persuasive counter-argument depends on connecting either a new situation or a new strategy to a different outcome.

Further, this statement is weak because it is not connected to anything else, because the source of the information is not made clear and because (if using ideas from a textbook) the information may be five years old or more. And, as in A2/, most companies would worry about X only until you show that worrying is a waste of effort by finding an interesting way to break the rule.

B/ Buzzwords™

The style of answer may appear useful or appear professional because business gurus are able to make lots of money using buzzwords. The weakness in the logic is demonstrated by the unseen hordes of wannabe gurus who have only their own buzzwords and cannot answer hard questions. As you may know, many people laugh at executives who use buzzwords to hide a conclusion. The game Buzzword Bingo is funny precisely because certain words have been misused to the point of having no meaning. The ability to answer questions, not the ability to use buzzwords which become out-of-date when the next guru is anointed, is why successful gurus are paid big bucks.

Using buzzwords and jargon is not entirely bad. This point needs to be clarified since many jobs require a specialized language: for example, doctors and engineers spend years learning their language before being allowed to do their jobs. Experts use specific words and phrases because they find that such words convey information quickly and precisely to other experts. I remind you that experts also have such a deep understanding that they can express the same ideas to non-expert audiences if they want to.

To give you fair warning, I detect the *mis*use of buzzwords, jargon and slang in the same way that I detect other types of confused arguments: by seeing when the words being used are not connected to the things which should be part of the answer. It can be hard for a student to know whether a word is being used as useful jargon or as a misleading buzzword. With practice, you can learn to distinguish the two uses and university is a time to learn that new language with relatively few bad consequences. So, my suggestion is to use buzzwords, if you want, but only when they fit naturally and usefully into the answer.

New buzzwords can be useful but I suggest that you should be suspicious of them until they have passed the test of time.[13] Personally, since my mom is fairly bright but does not know the fancy words, I like the "Mom Test": if I cannot explain something in simple terms to her then I usually do not understand that thing as well as I think that I do.

C/ Repetition

I noted that an explanation is more than a statement of the conclusion. Some students seem to answer a question by stating the conclusion repeatedly or by changing the words slightly. For example:

i) "An increase in price decreases quantity demanded because quantity demanded falls whenever price rises". In terms of consumer behaviour, this statement is not connected to anything other than itself. In terms of data, the stuff after "because" is not always true (see A3 above).

ii) "The world is changing fast because the environment is changing with increasing frequency."

[13] For example, do you know the meaning of previously essential buzzwords such as "excellence", "competing on time" and "buzz marketing"? If those were too easy for you, do you know how to use the following terms correctly: "kaizen" "MBWA", and "Spoc"? So, what are we to make of the established buzzwords of today, such as "six-sigma", "EVA™" and "balanced scorecard"? (Sources: *Harvard Business Review* Sept. 1989; http://www.amanet.org). When writing an essay, you might find this website useful: http://www.fightthebull.com/bullfighter.asp

iii) "Sellers desire desirable clients."

iv) "Profits are more sensitive to an increase in output because of a higher marginal cost. Thus, a change which lowers marginal cost makes profits less sensitive." (This statement also confuses a change in total cost with a change in marginal cost.)

Repeating a statement with variations can be seductive because, as example iv) shows, no one sentence is obviously wrong.

Often, the last sentence in this style of answer begins with the word "Therefore, …" or "Thus, …" Using either of these words suggests a connection to the immediately preceding sentence(s) but, because I have the advantage of knowing what I am looking for, I often do not see the links between the beginning and the end.

C1/ Trust me!

A variation on the Repetition style is an answer which can be summarized in two sentences: "My answer is …" implicitly followed by either "Trust me, I know what I am talking about" or "Take it or leave it." Without providing an explanation, the risk you face is that I may "leave it."

D/ CYA

Some student answers start with a conclusion and then give a list of reasons why that conclusion may be wrong. For example, in response to a question asking "does an increase in price reduce quantity demanded by consumers?" some students will respond with something like

> "Yes, but a firm can offset that decrease by improving quality or increasing advertising or may get lucky if consumers perceive the higher priced product as being different."

The worst versions of this style of answer never actually explain why the first conclusion "Yes" might be correct. Such answers imply that the conclusion is so obvious that it was a waste of time to ask the question.

What is more troubling is that the rest of the answer is not connected to the question because it could have been true anyway: the firm could have increased quality or advertising anyway, regardless of whether the price increases decreased or stayed the same. Further, the list of "reasons" may be just a list in the sense that no item on the list has a supporting argument which would show its importance or connection to other ideas. (See also H below.)

I am not looking for this kind of CYA (cover your ass) answer. It is possible to give a variation on this style, and be effective, by telling me about critical bits of information that you need to know. Then show me how or why knowing those bits would make a difference to your conclusion. By showing that you know what is critical, even if you do not yet know the specific answer, you show that you can be trusted with a budget to go find out what you need to know. The essential problem with this style of answer is that it fails a fundamental test of any strategy: as Porter[14] says, developing a strategy is about making a choice.

D1/ Impossible to know for sure

A variation on the CYA style of answer seems to be based on that idea that it is impossible to know anything for sure. If it is impossible to know anything for sure then it does not really matter what I say. Or what you say.

It is true that data are imperfect: consumer lie on surveys, focus groups include some pretty weird people, hard market data is about historic events and the data are less detailed as you might like. But biases in data can be offset and imprecise data can be refined using the ideas taught in other classes that you have taken or will soon take. So these concerns are real but are

[14] Porter, M., 1996. "What is strategy?" *Harvard Business Review*, Nov., 61-78.

not sufficient, by themselves, to reach or reject a conclusion.

It is also true that some people behave in strange ways that are hard for the person to explain to somebody else and even harder for an outside observer to rationalize. While that statement may be true, trying to understand the strangeness is irrelevant unless you seek to understand your boyfriend/girlfriend. To develop a marketing strategy, we are concerned about how groups of individuals behave: focusing on an individual confuses "a tree" for "the forest."

This style of answer also often fails to understand that, even if something is wrong on average, it is not necessarily wrong in the specific cases being discussed. Instead of finding more reasons to ignore data, the purpose of this course is to learn to be skeptical. Instead of doing what a 3 year old does when served food that they do not like, a more mature answer shows how much you can rely on the available information (in combination with other information that you may have).

This style of argument often fails to understand that, between the concept of "true" and "false", lie answers that are "probably true" and "probably false" or, between "all" and "none", is "most", "many" "about half", "on average", "some" "and "a few". Being able to give a good explanation shows how much you understand and how much we can trust your judgment to deal with these objections.

If you want to pursue this unconstructive line of reasoning seriously, please enroll in a Philosophy class and engage in a debate of whether this life is really a dream or whether we all live in the Matrix.

D2/ Details, details, details

Some answers to test questions seem to emphasize the thousands of details needed to find an answer: if everything is an exception to a general rule then there is no general rule. But, if there is no general rule then all strategies should be equally likely to be successful, which is clearly untrue. I am also annoyed by students who base an answer on one detail that was left out of the question when I spent an entire lecture discussing a more important aspect that should have been the focus of the answer. While knowing the details has some value, I have several responses to show why this style of answer is not as convincing, as reliable, or as valuable as you might think:

i) If all of the details were included in the statement of the question then do you know how to use them? If you expect your job to be one of calculation based on information provided by others using a preformatted spreadsheet, how do you add value to an employer? The discussion in the second Appendix tries to make these connections.

ii) Sometimes, the necessary details are included in the statement of the question but not necessarily in the form that you expect. Or, a question may include too much information and people who focus on details become overwhelmed by the irrelevant information. Or, a question may omit something.[15] In each of these cases, knowing enough to answer a carefully-scripted question in the controlled environment of a test is not enough to demonstrate the kind of Excellence expected of an A student.

iii) Sometimes, the answers to my questions do not depend on knowing all of the details because I have worded the question in such a way that a detail which never changes is irrelevant. For example, if I ask about whether an increase in the price of a good causes an increase in total revenue, it may not be important to know consumer income. Each person's income would affect how much they buy *before* the price increase and *after* the price increase but my question is asking about the effect of the price increase itself. The *magnitude* of the increase or decrease may depend on the level of income but this question does not ask about the arithmetic. Bad style

[15] "Not knowing X" differs conceptually from "knowing that X= 0".

J will discuss some of the issues associated with arithmetic answers.

For this example specifically, I have some bits of advice. First, adding assumptions to clarify the question in your mind may help you but may have no effect on the answer from my perspective. For example, if clearly stating the assumption that a consumer's income is $1000 makes you more confident and if, from my perspective, the answer is basically the same regardless of whether income is assumed to be $1000 or assumed to be $10,000, then basing an explanation on an income of $1000 does not matter to me. If it makes a difference to know whether consumer income is $1000 or $10,000 makes a difference, and you do not recognize why it makes a difference, then you have shown that you do not understand what is important.

Something becomes an *irrelevant* detail when it is always true: i.e. true in principle but irrelevant in practice because it does not change. Understanding this irrelevance may be especially relevant to a marketer since trend spotters are always trying to be the first to spot the Next Big Thing. The problem with spotting trends is that it is easy to spot something that seems popular now but, without adequate background research, you may confuse something new with something that is new only to you.

Focusing on a detail to answer a question can be *annoying* because the effect of the detail is *in addition to* the main effect, not *instead of* the main effect. Yes, that detail could be relevant but, by saying that a detail has a big enough effect to reverse an answer, you are making a claim about the relative size of two different effects. A good answer would connect this claim to something more fundamental and more secure than it "could be relevant". Or, to use the suggestion noted on p. 8, a good answer would clearly state this important feature as one of the planning assumptions that you would research more carefully if you had more time.

This issue of whether a detail has a big or small effect offers a relevant counterargument to students who think that economics is excessively mathematical. If every detail is equally important and if many details need to be studied then, on average, the positive details should offset the negative details. Statisticians can describe the phenomenon precisely with the Law of Large Numbers. The informal description of this Law implies that, unless you can describe *every* detail precisely or unless you believe that the effect of every detail goes in the same direction or unless you can explain why a few details are big while most others are small, the average difference between a precise solution and a solution which ignores the details will be small. This reasoning helps to explain why focusing on the effects of changes produces insight.

iv) Some people seem to believe that the real world is so complex that, for each answer, there are conditions under which it is the correct answer. If they look long enough, they will find those conditions to prove that their preferred answer is right. That perspective is not good enough for business planning since the plan needs to be based on the conditions as they exist (rather than having a plan and looking for the conditions to use it) and you need to recognize which conditions need to be verified.

v) If that you think certain details are important then an excellent student would consider them fully. The most common oversight occurs when those details vary continuously, such as price or expenditure. While discussions which distinguish between "high" and "low" are easier, there are times when small differences matter or where the difference between a smaller decrease and a bigger decrease is relevant. The best answer to a particular question depends on the precise wording of the question but, if you think that knowing details are critical then you have also indicated that you think that you need to get all of the details right. So, please be consistent with yourself.

vi) To extend the previous thought, knowing a detail might be useful in an ideal world but, in the less-than-ideal real world, it may be impossible to measure. If so, then knowing that detail is as useful to developing a marketing plan as knowing the number of angels that can

dance on the head of a pin. In such cases, adding depth to an explanation would suggest which detail needs to be measured if you were ever asked to implement an answer. Adding depth to an explanation would also indicate the risks associated with mismeasuring that detail.[16]

vi) Even if you provide enough details to show that my preferred answer is not right, your own comments may not be sufficient to show that you are right either. If you want to argue that details are important then consistency demands that your own answer should provide complete details. Otherwise I can counter with other details to show that your answer misses something important and, therefore, does not deserve full marks.

vii) In the context of the classes that I teach, it is often important to use the available information to find an operationally relevant action or strategy. An operational strategy cannot be based on details that are impossible to measure, or not available when needed. And some details may be important to consumer behaviour but not necessarily to strategy. Focusing on details while missing the bigger picture is like a lawyer who spends his or her time looking for technicalities and loopholes to release a client, rather than focusing on proving the innocence of the client.

Ultimately, and this part is more a matter of my personal taste since some smart people seem to believe the opposite, I think that using details to rationalize[17] an pre-determined answer is a non-constructive exercise: that answer may be wrong. Focusing on details confuses "description" with "explanation"; a description can say what is but it is often more important to say what will be, to say why or to say what is not (or is missing from what is being reported). If details matter, and they do, then you should want to know all of the details. And, to be internally consistent, an explanation needs to recognize all details which could change an answer.[18] But it is impossible to know all of the details, either for an individual human being or for a socio-economic system, because there are countless feedback channels as well as trade offs with complementary and substitutable means to the same end.[19] Getting the details right is especially

[16] An advanced version of this attempt to evade a real answer is apparent in students who complain about the use of concepts that seem unmeasurable and, to a different professor, complain about the difficulties of doing good statistical analysis (or about its irrelevance) and, to a third professor, complain that their high school did not cover enough algebra to enable them to answer the question (after complaining, to their high school math teacher, that learning algebra would never be useful).

[17] There is a small chance that, next week, Martians will land on Earth and start to compete using their superior technology. This chance may be small but the smartest minds at NASA cannot deny the possibility and, even if they did deny it, should you believe them after their experience with faking the Moon Landing? http://www.clavius.org/site.html

[18] To give an extreme example, consider astrology. Some people believe what is written in a newspaper's horoscope under their sign. If it is not accurate on a given day, it must be because that horoscope did not account for "Venus rising". But, if you dig a bit further, which you should if you are being sincere, you should also account for all of the planet and moons, as well as the exact time of day and location of birth. You should dig further but, eventually astrologers face a problem that their information is imprecise and there are too many variables to make a clear prediction, in spite of the fact that many people believe. For more comments, see the Amazing Randi's experiment http://www.badastronomy.com/bad/misc/astrology.html#accuracy. For a scientific test, see http://www.nature.com/nature/journal/v318/n6045/abs/318419a0.html.

[19] The most familiar representation of a socio-economic system may be the familiar supply and demand picture but the difference between a shift of a demand curve and a movement along a demand curve is critical and widely misunderstood. The difference is fundamentally connected to my idea that an explanation is a connection between cause and effect. Even from an evolutionary perspective on the market process, it is hard to distinguish cause and effect. For humans, it is easy to propose an aspect of behaviour, such as habits or peer pressure, but understand their effects fully requires one to also understand how these effects are not limited to one product category or market. Therefore, the relative effect on different categories may matter and there may be self-regulating mechanisms whose importance is hidden until the environment changes. An important aspect of the analysis is whether the detail is a

important when implementing a plan but not at the stage of working out the big ideas on which the plan will be based. Most university students are still trying to learn the big ideas and all of the ways that they can be used.

E/ More than one right answer

Even if your answer is right, it may not be the *only* right answer. Depending on the question, the answer may be true but incomplete. Or the answer may seem correct, except that that answer is ruled out by some part of the question that was added so that you would be forced to look at a bigger picture. Thus, when I encourage you to explain the connections, I am asking you to identify the relevance and relative importance of different partially right answers: to use an example from business, a vague or generic strategy offered by a lazy consultant would be criticized by managers who ask tough questions about its relevance to their situation.

Perhaps the most familiar example of this may be the Law of Supply and Demand. When asked to explain why the price of a good or service increased, an engineer might focus on the production side of the market while a psychologist might focus on the role played by consumers. It is true that an increase in costs can increase the market price (and this increase can occur for many reasons) and it is true that a change in consumer tastes can increase the price (and this change can occur for many reasons). Many people have trouble recognizing both alternatives before finding the most appropriate one, and this difficulty is not just an academic issue where the consequence is a lower grade on a test. The differences between the alternatives have fundamental implications for business strategy. Even after the two alternatives are identified, most students can state some of the reasons which are sufficient to cause the change. Surprisingly, many students have trouble articulating what is necessary to distinguish which of the different possible causes is most relevant here and now.

Some students have been infected by a weak version of post-modernist thinking where everything seems to contain its opposite. This infection is revealed by comments such as "Everything is a matter of opinion" or "There is no such thing as objective analysis".[20] I will not debate this issue here because I hope that a student will defend their opinion with something more forceful than "I think I'm right".[21] By asking students to give an explanation, my intent is to enable a student to confidently articulate the steps in an argument (either made by them or to them), to recognize which steps need to be filled in before one can be convinced of a conclusion and to identify when the usually-right answer is not appropriate. This confidence enables

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cause or an effect. If it is an effect then the cause lies somewhere else and focusing on the detail misses a more important question.

[20] This issue of subjectivity may appear more commonly in economics classes than in business classes because economic analysis may discuss political issues. It is easy to find a right wing politician who will claim that the policy solution to every situation is to lower taxes and let the free market be free: when the economy is good, then these policies are valid because it is a bad idea to change the policy that produced the good times and, when the economy is bad, then the policies are currently the best choice because disrupting the economy would make things worse. Similarly, it is easy to find a left wing politician who will claim that the policy solution to every situation is to increase spending and regulate behaviour. While it is easy to find such politicians, these notes argue that an intelligent voter does not need to believe either of them: as a voter or taxpayer (who is hopefully paying a lot in taxes because you earn a lot of money), you can ask for (and expect) a deeper explanation from politicians. As a student, you can learn to focus on the reasoning process instead of the generic conclusion.
Similarly, I find it humorous how many marketing students think that the best strategic solution for any business in any situation is always the same: raise price, increase advertising and differentiate the brand. This solution may be common but, unless you want to be as annoying as a dogmatic politician, make sure that the answer varies with the situation.

[21] To demonstrate the weakness of this position, you should understand that the stating "I think I'm right" is weaker than stating "I'm right and you're not" or "I'm right because …".

students to recognize the difference between relevant and irrelevant facts and to ask the kinds of thought-provoking questions that would impress a guest speaker. Thus, even if knowledge is subjective, conclusions can be refined.

E1/

It is possible that a set of facts are connected only by coincidence. For example, when looking at some real data on sales by different sales reps during the last year, how do you know that the rep with the highest sales is actually the best? It could be because that rep was the best or it could be that top selling rep got lucky and the best rep was unlucky or, maybe, it could be that all reps were equally capable and the rules of arithmetic says that somebody has to be on top and somebody has to be bottom. Or, to take an example which emphasizes the dangers associated with a mismatch between the questions used to generate the data and the concepts or intuition being used to explain the data, suppose that you were presented with some data concerning people's preference for different colours. If green was the colour preferred by the most people, that fact *could be* caused by people's concern for the environment. But the more important question is: *is* that fact caused by people's concern for the environment (or is it caused by something else or for what fraction of consumers)?

So, is a connection relevant? Do you know how to distinguish something important from a mere coincidence? Are you willing to "put your money where your mouth is" by defending your judgment with a complete explanation?

F/ Another alternative is also good

In response to a question such as "Does X increase profits?", some students will ignore X and respond by arguing that Y increases profits. Or they will argue that X is a good choice because choosing Y would be bad. Answers which use this style are weak because they do not connect the central issue, X and profits, or they do not consider alternative Z, which is better than either X or Y .

Some versions of this style of answer say something like "bad things *might* happen". While the statement is not wrong, it is not convincing because

i) there is no connection between these things and the strategy: the bad things may be true under all alternatives,

ii) X may be part of a larger strategy where other part of the strategy could reduce or eliminate the bad things,

iii) good things could happen, and

iv) maybe all choices are bad but some choices are less bad.

The best answer in many situations must recognize that trade offs are common or that, because of an imperfect connection between cause and effect, there is a trade off between risk and return. Ignoring these facts is evidence that the arguer is not ready to progress to next level of analysis (which considers such issues more deeply, such as how big is the trade off or how a fuller strategic analysis could change this trade off).

A particular variant of this bad style of argument is sometimes used when students try to balance costs and benefits. For example, in response to a question like "would an increase in advertising expenditure increase profits?" some students argue that "it is a good idea but only if it can be funded out of past profits" (or that some other cost be cut). This is an odd answer because, after stating that the goal is to increase profits (i.e. revenue minus costs), the argument changes the question by implying that not all costs are equal. If increasing advertising were a good idea then it should be self-financing. And if it is not self-financing then it is not a good

idea.[22] So, some questions ask you to understand the connections between ideas because those connections help to define the real problem.

In response to a question such as "would an increase in price increase revenue?", some students respond with something like "yes, but only if the quantity demanded does not change". This answer would make a mathematician and an accountant happy but overlooks a common theme in many courses: behaviour. In this case, a change in price is expected to change quantity demanded and the connection between price and quantity demanded is extraordinarily important in a wide variety of business classes and businesses.

G/ Humpty Dumpty[23]

"Oh, you know what I meant. I just used different words." This university thinks that I know the answer because I am teaching the class. *But,* I am not taking the test. *But,* when others in the class do not know the answer, how have you distinguished yourself from them? *But,* different words mean different things and, if your words are vague enough that the meaning of the answer can change then those words were not very precise. If it was not very precise, then you are not ready to go to the next level.

I am willing to give the benefit of the doubt when marking, based on the general quality of the explanation and on a comparison with conversations that I have had with many students over many years, but it would be better for you if I did not have to guess. As more practical advice, this style of answer may indicate somebody who is relying on unspecified background information. As a teaching exercise, I am trying to get you to turn that background information into foreground information and to show you that some of the background information is wrong in general or wrong in a specific time or place that matters to you. So, clarity helps you and me.

H/ Pros and Cons

Instead of giving an explanation, some students seem satisfied with making a list of pros and cons. Making a list is a good way to sell business books (with titles like *The Seven Habits of Highly Effective People* or *The 87 Things You MUST Know to Succeed in Marketing*). But it is hard to remember all 87 and it is hard and time consuming to remember those 87 plus the 34 offered by another author plus … Focusing on a list also ignores connections, especially as many questions involve choices and trade offs. Thus the relative length of the Pro list and the Con list is not convincing (see also F). Finally, the magnitude of a cost or a benefit may be unstable and this instability may reveal a deeper connection that was left off the list.

Making a list may be a sufficient answer for certain types of questions. After leaving university and especially when implementing a plan, it will be important to know how to apply that list. Good students can make the list and know how to apply the list to real world; weaker

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[22] If you want to be precise, try introducing the detail of managing the cash flow: ideas which are good in the sense of present value over a year may require so much expenditure initially that the company does not survive past month 3. But, note the word "may". If you want to use this detail to justify an answer then it should be noted explicitly. You should also note that cash flow problems can be overcome and I would expect a discussion of the financing options and, depending on the content of the course, the price and availability of those financing options may depend on other aspects of your marketing strategy. So, by focusing on other issues and not considering this cash flow issue, I am simplifying the problem for you so that you can learn about something else. Please be aware that complex problems like this one are waiting for you outside a university and partial answers are not a solution.

[23] This style of answer may be known as a Humpty Dumpty style, from *Alice in Wonderland*:
"When I use a word," Humpty Dumpty said in a rather a scornful tone, "it means just what I choose it to mean -- neither more nor less."
"The question is," said Alice, "whether you can make words mean different things."
This style may work if people are forced to listen to you but it does not encourage productive cooperation.

students might be able to memorize the list but are often unable to remember it well enough to make the connection between the list and a specific application.

Checklists can be a good thing if you are in charge of a complex process and you need to execute all parts of the list or if many people are involved and you need to coordinate their actions. They are also helpful if you are likely to forget some part of an answer. But, by itself, learning a list does not replace real understanding because a list contains no indication of importance, because real life may not exactly fit into the categories expected by the list, because taking the time to check everything off a list that worked in the past may cause you to overlook something more important that is important for the future and because doing everything on the list does not guarantee success. And, especially for marketers, because many people have excelled by finding interesting and innovative ways to "break a rule" on that list.

I/ The Scarecrow (from the Wizard of Oz)[24]

Some people have learned to fill space on a test. For example, in response to a question asking "What causes X?", a student may give an answer such as: "X is important because it affects profits, marketing strategy, and the willingness of people to work from 8am to 8pm." While reading this answer, you may have noticed that this answer focuses on the effects of X and says nothing about what causes X. In fact, the answer does not depend on X in any essential way: X could be inventory policy or the colour used in an advertising brochure.

This style may work if people are forced to listen to you, e.g. if you are the boss, but it is unlikely to work if you are trying to convince your boss of something and if your boss is trying to remember why he/she hired you. I probably asked the question because I wanted to see if you understand that causal connection between X and profit and this answer shows that you do not understand it well enough. One professor showed how the tactic of filling space would look if applied to something more important.[25]

Filling space is a good idea when it serves a purpose. More complex answers require more space to fully discuss all of the things which need to be discussed and good answers fill space with relevant words. Confusing the act of filling space with the act of giving a complete answer makes the same mistake as the person who thought that he was going to become a sumo wrestler by becoming fat.

This style of answer is not very common since many students have a lot of trouble filling the minimum space requirements on an essay. It is surprising that a student has trouble writing 10 pages or 5000 words on a topic that has consumed the time and energy of other people for years. Not wanting to spend the time to write so much about a boring topic is another issue but, if this is your concern, you should remember that I think that the ideas that I am teaching are interesting and useful.

Other people may counter by arguing that my preferred style is too linear and that they prefer a more circular style of answer where the appearance of filling space is actually an intent to look at a question from all sides. While accepting the logic of this counter-argument, my concern is that you should not confuse offering a circular answer with not offering any answer. And offering a circular answer does not justify breaking the rule of grammar that "one paragraph

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[24] Scarecrow: I haven't got a brain... only straw.
Dorothy: How can you talk if you haven't got a brain?
Scarecrow: I don't know... But some people without brains do an awful lot of talking... don't they?
Dorothy: Yes, I guess you're right.
Source: http://www.imdb.com/title/tt0032138/quotes

[25] Lederman, J. 2005. "How to write a love letter", *Annals of Improbable Research*, 11 (5). http://improbable.com/pages/airchives/paperair/volume11/v11i5/love_letter_11_5.pdf (August 17, 2006)

should contain one idea."

Time management is an important life skill. If you really want to "talk about" a problem from all angles, you probably should not challenge professors since we spend our time looking for things that would be "interesting to investigate". So, this counter-argument seems inconsistent with the mindset of the typical business student, yet is used.

I1/ Crossing a stream on the backs of alligators

There is a scene in a James Bond movie where the hero is trapped and about to be eaten by hungry alligators. He escapes by running across a line of alligators by quickly stepping from one alligator to another without resting on any one too long. In the same way, some answers offer a sequence of true statements that are loosely connected but no one statement is considered deeply. Some famous people use this strategy very well by taking time and filling space with new information. It can be a very effective debating strategy because the opposition never gets a chance to question the context of a statement, or to investigate the strength of the connection to the conclusion.

There are two particular problems with this style of argument. First, as noted, how can we trust the conclusion if we cannot investigate the connections leading to that conclusion? (This is the reason why stunt men do the dangerous work in movies.) Second, even if the statements are true, an opposing statement may also be true (but unrecognized). Third, by omitting the context, one is not sure whether the new information is based on a commonly-held stereotype or tendency, as opposed to being an established fact. University is a time for you to investigate ideas that will be used later when you have less time to evaluate the quality of an argument. The James Bond example also shows that an explanation is only as strong as its weakest link: it is not enough to get halfway across an alligator-infested stream.

J/ Arithmetic

Numerical examples can be useful and are sometimes convincing. They can be especially useful when first thinking about a problem or when constructing the kinds of *counter*-examples that prove an idea to be wrong. The danger with using arithmetic is that an example may contain unrecognized assumptions that limit its relevance. Thus, instead of being an explanation, a numerical example may be a special case or an illustration. The fact that you use a numerical example, without making the connection to a more general explanation, indicates that you do not understand the general idea as well as I hope.

Relying solely on arithmetic, without any discussion, is a dangerous style of answering because, even if your argument is correct, silly calculation errors or using the wrong data can produce the wrong answer. If I were to base your grade only on your final number then, as a matter of procedural fairness, I should judge everybody's answer using the same format. If I graded simply on the final number then most students would get low grades because of lots of silly mistakes. I think that such a process would produce grades which do not accurately reflect the depth of understanding but, if you do not give a simple explanation of your arithmetic because you think that the answer is blindingly obvious, then you are not helping yourself. Further, if the answer is the opposite of blindly obvious, starting to provide an explanation gives you a chance to build the steps toward an answer before you remember that key step.

Some students seem surprised when I ask for an explanation of something that seems as simple as proving that "1+ 2" equals "3". For example, I may ask whether the sales to a family of one person plus the sales to a family of two people is equal to sales to a family of three people. Or I may ask whether selling to two consumers, one of whom earns $1000 per month and another who earns $2000 per month, is the same as selling to one consumer who earns $3000 per month. Claims similar to 1+ 2= 3 are embedded in many formulas because they make the

arithmetic simple enough to work out on the back of an envelope or on the kinds of $5 calculators that are usually sufficient in my classes. But, if you do not recognize when something that seems simple is not simple then you cannot recognize when this error will mislead you and you are not ready to understand the more advanced methods of analysis that would find a more precise answer. If you do not recognize the problem in a simple test question, you will surely have problems with the more complex and less well-defined problems waiting for you outside of a university.

Working out "the" answer is usually only an intermediate step. My questions can usually be solved by hand even though I know of ways to solve more complex problems more generally, faster and using fewer steps. I do not teach these more powerful ways because they should not be used unless everybody in the class can use +, -, * and / confidently. Asking for an explanation of simpler problems is a teaching trick used by me; people who have trouble with simple questions can learn what they need to correct and people who can give a good explanation to a simple question can move to the next level on their own.

Some people are mathophobes and are afraid of +, -, * and /. I have seen it often enough to admit its reality but, as a non-mathophobe, I am often surprised by this attitude because numbers are widely used in business: Excel is becoming an essential skill if you want to work in an office and graphs are used everywhere. Fear of all forms of math limits career choices.[26]

I think that a student can reduce this fear by seeing mathematical analysis as another kind of story telling. Focusing on the math without recognizing the connections to people and behaviour is a serious oversight since business is about people (see the last paragraph of F/). The purpose of telling any story is to explore the relationships between the actors as clearly as possible. The restrictiveness of the rules of arithmetic means that some of the things which you would like to be true are not: for example, selling 2 units to Jack and 2 units to Jill cannot suddenly become a total of 5. The fact that you have to work within the rules can be very frustrating when learning the rules. With practice and experience, these restrictions should remind you of something that you overlooked: for example, if you build a story based on 85 percent of the population then the rules of arithmetic may tell you that you should investigate the remaining 15 percent to identify a missing opportunity. Thus, the rules of arithmetic are designed to ensure that your story is a non-fiction story. Similarly, I ask for explanations of even the simplest arithmetic answer because the arithmetic is connected to a bigger and more conceptual purpose.

J1/ Journalists and numbers

There is a variation on this style that journalists seem to like because it sounds impressive. Consider the following statements which attempt to link the price of oil to the situation analysis facing a summer vacation resort.

> "Record high prices for crude oil of nearly $140 per barrel are causing severe problems throughout the economy. As the CEOs of major oil companies earn

[26] "Math will Rock your World", *Business Week*, Jan. 23, 2006. (cover story), http://www.businessweek.com/magazine/content/06_04/b3968001.htm (accessed Jan 2/07)
"Algorithms" *Economist*, September 13, 2007
http://www.economist.com/business/displaystory.cfm?story_id=9795140&CFID=2742795&CFTOKEN=41351658
Sabrmetrics: http://www.sabr.org/ http://auricle.net/ http://www.baseball-reference.com/
Math is useful http://www.weallusematheveryday.com/tools/waumed/home.htm

In addition, some widely available computer packages (e.g. Solver in Excel) can answer very complex questions quickly if you know how to ask the questions. The problem that mathophobes will encounter is that these packages rely on the standard rules of arithmetic. If the rules are not implemented correctly then the output may seem realistic except that it is disconnected from any reasonable story.

> millions of dollars annually in salaries and bonuses and as imports rise, the ordinary consumer was shafted by last week's 10 cents per liter increase at the pump. For an average consumer, this translated into $5 per fill-up. Since Canadians consume more that 2 million barrels of crude oil each day during the summer driving season, vacation resorts are worried. Some are forecasting a 17 percent decrease in business this summer."

These statements seem connected but, with some thought, the connections become surprisingly loose. Though there are four sentences and four numbers are given, no two numbers are comparable: the units differ, sometimes in dollars and sometimes in percentages, sometimes per barrel, per fill-up or per liter, sometimes it is a specific number, sometimes the number represents some type of average and sometimes the number is too broad to be useful.

With a little more work, you can be more useful by making the connections more obvious. Consider an alternative series of statements:

> "Crude oil prices of nearly $140 per barrel, up by 50 percent from last year, are causing severe problems throughout the economy. Once the typical processing and distribution markups of 40 percent are added in, experts believe that last week's 10 cent per liter increase is only a fraction of the 46 cent increase (i.e. 50 percent above last year's 93 cents per liter) that can be expected by the time that families will face when driving to their favourite vacation spot. For an average family car with a fuel efficient rating of 10 liters per 100 km, the higher gas prices mean almost $70 more for a 1500 km. round trip. The higher oil prices will also increase shipping costs for all products and reduce the discretionary income of consumers. While vacation resorts near major population centres report being sold out earlier than usual for the summer long weekends, the increased costs are worrying vacation resorts further away. They expect a 25 percent decrease in business this summer."

My rewriting is longer and not as colourful as the original but it adds important information which connect the beginning (crude oil price) and the end (sales at summer vacation resorts). These connections provide a more solid basis for debating the details of a business plan of a particular resort.[27]

To summarize, the common theme in these bad styles is that they are confused concerning connection, clarity, consistency, comparison or all of the above.

[27] Some questions remain. As a puzzle in accounting math, I leave it to you to find the connection between the price of gasoline and reducing a CEO's salary by $10m. As noted elsewhere, if the connection were simple, then the journalist could have discussed them in a sentence of two. If they are not simple then the journalist left something important out. Did you recognize what was left out when you read the first statement?

Appendix B: Alternative Answers[28]

Many students seem to view the professor as the embodiment of why their grade is low, in the sense that the grade would have been higher if only Professor X had been more generous. A slightly different statement is not true: "the grade would have been higher *only if* Professor X had been more generous".[29] The dangerous aspect of this "my grade would have been higher *if only* Professor X had been more generous" attitude is that excellence in business requires you to light a fire under yourself.

Most students have been given advice on what constitutes a good answer (i.e. it should be complete and consistent and connected) but the advice does not seem good enough. This Appendix takes a different approach: it uses a single question that is commonly asked on tests in a course that many students must take and offers more than 40 different kinds of weak answers that are regularly seen by those who read such answers. Hopefully, seeing these answers will enable you to know what to avoid regardless of the professor's opinion.

Almost all of the answers assert the "right" conclusion but this Appendix may illustrate why being right on one question is not good enough to excel. The comments accompanying the weaker answers help to show why the answers are weak in the context of a university classroom and are weak in connection with a long list of important managerial, social and government policy questions. By providing this longer list of weaker answers, I hope that a student can see patterns to be avoided and learn to give better answers to a wider range of questions in a wider range of classes.

The discussion below applies a "*show*, don't *tell*" teaching style.[30] Lectures are supposed to *show* students what is worth learning, possibly because it is surprising. On a test, students are asked to *show* what they know and, when the answers are returned, it is more common that they are *told* what was wrong. The comments on the weaker answers show the importance of making connections and the significance of the omitted connections. The comments show how the ability to answer this one question offers valuable insights into the methods used to answer other questions, independent of whether you can get the "right" answer to this first question.

After writing this Appendix, I find it to be surprisingly long and that length may illustrate why it is difficult to give short and memorable advice on what constitutes a good answer. The A answer is offered first so that readers can see what is missing from the weaker answers. Even

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[28] Thanks to Peter McSherry for this suggestion, based on his experience with one of his professors.

[29] And, to use a bit of logic that should be familiar from a first year economics course, it is not clear that it is possible for Professor X to be more generous to everybody. If he or she was equally more generous to everybody, then the ranking of students in the class would not change. As soon as it becomes obvious that Professor X is becoming more generous, without students doing the work that is expected, then the grade is inflated but devalued.

To use other logic that should also be familiar from an economics class and other business classes: grading is not purely an exercise in ranking because education is not a zero-sum game. If each person in a class knows more (and knows what they know more precisely) then the increase in average knowledge benefits each person after they graduate. The benefit would be apparent before graduation when the instructors of following classes can investigate the kinds of issues that cannot be discussed deeply in earlier classes because they are more complex or more subtle.

[30] Using a "show, don't tell" style repeatedly may also help a reader gain the perspective of an outsider, such as a future boss or a marker who has to read answers from more than 100 students with bad handwriting, without the benefit of knowing what the author was thinking of when it was written. While it may be relatively obvious that a good answer needs to distinguish itself, the variety of answers shown here may help a student understand what a good answer needs to distinguish itself *from*.

explaining why the A answer is worth an A takes a lot of space and footnotes to explain why certain insights cannot be omitted (i.e. you should have listened in class carefully). The C, D and F answers are usually weak because they fail to be complete or a narrow answer fails a consistency check. The C, D and F answers have been shortened slightly to save space and, consequently, only a few illustrate how good answers demonstrate connections. Writing more would improve the quality of the answer only if doing so corrects a weakness.

Some students claim that tests are artificial and do not demonstrate knowledge of the real world. In an economics class,[31] consider a sample question such as

Does the market demand curve for apples slope downward?

This question could have been worded in many ways also:

Under what conditions does an increase in price reduce market quantity demanded?

What is the effect of price on quantity demanded by the market?

It should not be necessary to phrase the question as

***Why** does the market demand curve for apples slope downward?*

since university level students are expected to know that they need to fill in the "why". The precise wording of a question may affect some of the words that are used but should not affect the information that needs to be supplied. If a student can answer these questions precisely then I think that they are well-prepared to answer similar questions from the real world that are more hotly debated, such as

Will the Ontario government's decision to start a Harmonized Sales Tax increase or decrease purchases of apples? Or cars, shoes, total expenditure, …?

Does a government subsidy for used cars increase car sales? (Assume that manufacturers do not change their price.)

If 100,000 cars are sold each year in Canada and, for the next six months, the federal government gave each buyer of a new car $1000, what would the government's expenditure be? (Hint, the answer is unlikely to be $50m.)

These later questions are not exactly the same as the first ones but their answers use the same tools (at least as a starting point). If a student cannot answer the original sample question in a testing situation completely, consistently and clearly, then they can be easily confused in a different context when the consequences are more severe. Thus, and despite its appearance, this sample question is deeply connected to questions in the real world about which students claim that they want to learn.

Answers to ***Does the market demand curve for apples slope downward?*** are listed below in italics and the commentaries are shown in the regular font.

A: *A market demand curve is defined to be the relationship between the market price and the*

[31] Some readers may object that the grades given to these answers may be higher if given in another course. While the answers use definitions and ideas appropriate to an economics class, the explanations of many of the weaker answers are long because the extra discussion shows why poor understanding is relevant to a wider variety of issues and courses. Courses offered by other departments may refine certain aspects in greater detail but if you cannot apply or recognize those details when needed and using your own words, then the value of this kind of detailed understanding is more illusory than real.

A deeper resolution to this objection would be to create a question used in a non-economics class plus a list of good and weak answers with an explanation of why each weak answer is weak.

total quantity demanded over a fixed period of time[32] by all consumers, holding other things constant.[33] The total quantity demanded is the sum of the quantity demanded by all potential consumers. For a fixed price, the quantity demanded of apples by an individual consumer represents the number of apples that they are willing[34] and able to buy.

An increase[35] in the price of apples shrinks a consumer's budget set (reduces "real income") and increases the relative price of apples. To simplify the discussion without a loss of generality, consider a consumer who spends their income on only two goods: apples and oranges. Thus, an increase in the price of apples decreases the maximum number of apples that could be bought if all the income was spent on apples but has no effect on the maximum consumption of oranges if all income was spent on oranges. (As shown in this picture…)

If Z represents the bundle of apples and oranges that could be afforded and was most preferred before the price increase and W represents the bundle that could be afforded and is most preferred after the price increase, then we can compare[36] these two solutions to show how the quantity demanded of apples by a consumer changes because of the price increase.

Unfortunately, the comparison is not as simple as looking at a picture because the price increase has two effects: it reduces real income and it changes the relative prices. Assuming[37]

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[32] This aspect of continuing "flow", or demand over a period of time such as a quarter or a year, may not be emphasized much in class because, whenever the discussion looks at economic data, it is usually taken as obvious: e.g. the number of people laid off "during the last month" or sales "during the last quarter". Some instructors may note a difference between the concepts of a continuing flow and a stock at a point in time: e.g. the total number of people without a job at a point in time or total sales of a product over a lifetime, or the total capital stock.
This aspect is a minor issue except that a flow is sometimes confused with a transaction perspective which measures demand behaviour using some measure like the fraction of consumers who buy after entering a store. Since many of the marketing tactics, including price, are designed to attract consumers to a store, the transaction perspective overlooks important aspects of behaviour. Second, by looking at a flow over a longer time period, the analysis benefits from the Law of Large Numbers: analysing the flow of demand for a single week is possible but is more sensitive to small events, such as bad weather or a family vacation. In other words, rather than looking at the different types of trees, the question asks for a consideration of a forest. Since many people find it difficult to assess differences in the degree of risk or uncertainty, its analysis is left for more advanced classes.

[33] It often helps to start with definitions or clarifying assumptions because they can clarify the question. In this case, a definition represents the link between the information provided in the question and what the answer needs to contain.

[34] This phrase "willing and able" reveals that a good answer must display an understanding of two ideas: what a consumer is willing to do (i.e. intentions, preferences or tastes) *and* what they are able to do (i.e. recognize the constraints on that willingness).
Intended behaviour is sometimes confused with actual or ideal behaviour. Actual behaviour depends on other factors such as the actual price and actual supply behaviour. Ideal behaviour is a vaguer concept because it may vary with whose ideal is to be satisfied. Ideal behaviour, if defined in the sense of a social ideal, usually depends on the costs of production, the distribution of income and other things often discussed in connection with the "Invisible Hand". Seeking to understand intentions is especially relevant when trying to understand how consumers would react to a price, business strategy or government policy that has not been tried before.

[35] If the steps in the answer are clear enough then it would not matter whether the answer focuses on the case of price increase or a price decrease.

[36] For reasons discussed at greater length in the weaker answers, comparison is a critical step in this answer.

[37] By stating this assumption clearly and using it, the answer demonstrates the significance of this assumption. It is not necessary to assume that apples are normal; assuming the alternative, i.e. that apples are an inferior good, would lead to a comment that the income effect caused by the increase in the price of apples would cause consumers to increase consumption of apples. This comment would be connected to a comment that the slope of the demand curve would depend on whether the income effect or the substitution effect was stronger. In practice, once this assumption has been identified as critical, it can be investigated using data.
The same skill with using assumptions is relevant when developing a business plan because critical assumptions are identified during the initial planning phases. Later, as these early assumptions are confirmed or revised (based on

that the good is normal (i.e. that an increase in income increases quantity demanded, ceteris paribus), then the "income effect" of a price increase implies that this decrease in real income causes the quantity demanded of apples to fall. The "substitution effect" of a price change (due to the change in relative prices without changing real income) would cause a consumer to switch consumption away from apples to another good.

By adding these two effects together and by adding the effects on many consumers together, we predict that the demand curve is downward sloping.

This answer is longer than most A answers because it needs to define certain terms clearly for a reader who may not have taken the specific course, because it uses better grammar than is commonly seen on a time-limited test and because it does not use a picture (which could be worth another 1000 words).

This answer touches on all of the aspects necessary to a complete answer but answers provided by A students often contain a surprising addition. The most interesting additions, and those which demonstrate that an excellent answer excels, shows an awareness of the standard textbook answer and a curiosity about the kinds of weaknesses that are investigated in more advanced classes. For example, the decrease in real income caused by a price increase could be offset either by a consumer choosing to reduce savings or choosing to working more hours on a job. A simple suggestion that the consumer *could* do either is interesting and may be useful in a C answer but is ultimately unsatisfactory because it raises the comparison question: why didn't the consumer behave that way before the price of apples increased.[38]

Answers which excel may also mention the differences between the motives of a consumer as person and as a business in a B2B setting. Or it might discuss how adding peer pressure would change the answer.[39] Or it might discuss the effects of a more complex two-part pricing scheme, sometimes known as a volume discount which would also combine the ideas of the income effect and substitution effects in a different way. Or such an answer could identify an environment where the seller knows something special and is trying to signal that something by using the price. These answers would show how to augment the standard model and show the consequences of this augmentation, as opposed to the non-constructive advice discussed in the weaker answers offered below. A answers think outside of the box after exploring the box while weaker answers seem to think that the box is not worth exploring.

B: It is harder to describe a typical B answer because B answers show that a student understands the key ideas but does not excel. The most common weakness may be omitting one

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new information and research), the operational details of a plan change in ways that are easy to recognize. Only in poorly-managed organizations do the assumptions change to fit a pre-determined plan (i.e. conclusion).

[38] Some people argue that consumers do not maximize whereas economics, which is the focus of this answer, typically assume that decision makers optimize something. It could be true that consumers do not maximize but a test is not a good time to debate the merits of a particular theory for the first time. A sincere student would have asked the relevant questions during class time or during office hours. Then the merits of different ideas could have been debated and, instead of trying to discuss everything, the instructor could have added ideas that are particularly relevant to whichever idea the student views as most relevant.
For example, it is generally agreed that, even if people do not "optimize", they are goal-seeking.
Since the formal theory described in this A answer is at least a good approximation and since A answers excel because they add to the standard theory, a good answer to this question might note how non-maximizing theories (such as satisficing) add to the explanation of the link between price and quantity demanded. (Hint, in a comparative static context, this discussion is not as easy as it may appear, especially when talking about a *market* demand curve.)

[39] Hint: depending on the type of peer pressure, peer pressure may have the same effects as an "externality". Since different types of pressure produce different outcomes, failing to clarify the type of peer pressure and its transmission mechanism means that the answer is not as constructive or as useful as it could be.

critical step in the A answer or being sloppy in a couple of the minor steps. Thus, it is consistent with the idea that a B answer demonstrates "an ability to organize and examine the material in a critical and constructive manner".[40]

This statement also shows what will become apparent when reading the C, D, and F answer: that the examination is critical, in the sense that it shows what is important, and constructive, in the sense that the answer shows how the information that has been identified as important can be used to reach a specific conclusion. Without the depth of discussion shown in the A answer above, the reader is left to wonder whether the student is confused or does not recognize the significance of what is omitted: i.e. maybe the student is really a C student who got lucky on this one answer. A B answer may also indicate a student who has memorized the right answer to a simple question but, because of sloppiness, may not understand the material with sufficient confidence or depth to be able to use the memorized ideas in situation that differs from that which was memorized.

C: C1 *The answer depends on income and preferences because a change in income or a change in tastes would change how much people want to buy. Without more information, it is not possible to answer this question.*

C1 This answer fails to understand the ceteris paribus condition. It states that income and tastes are generally important to the answer but it fails to identify why this information is critical, or how the extra information would be used if it were given.

C2 *One of the most important ideas in economics, and repeated at the beginning of every class by Professor X, is the importance of substitution. This question represents an application of substitution: if the price of apples rises, then people will look to buy substitutes. Therefore people will buy fewer apples.*

C2 Each sentence is true but don't be so blatant in trying to repeat what the Prof said. If you go to a job and cannot use your own words, then your employer may want to hire Professor X instead.

This answer mostly ignores the role of tastes: substitutes are important, and the A answer mentions the "substitution effect" which is not defined in this answer, but the method of comparative statics requires you to give a context for initial consumption before finding the change. If the concept of substitution is important in this question then a good answer would show precisely how the concept applies.

C3 *Suppose that the price of apples starts at 1 and the price of oranges starts at 2. If a consumer has an income of 100 then their budget constraint would allow them to buy 40 apples and 30 oranges. If the price of apples rose to 2 then this consumer could buy 20 apples and 30 oranges with the same income. Because quantity demanded fell after the price increase, the demand curve is downward sloping.*

C3 This answer displays the understanding that a demand curve shows a relationship between price and quantity demanded; though it would have been better to provide a formal definition to recognize the importance of the ceteris paribus condition. It displays an understanding of consumers choosing a bundle.

The problem with this answer is that it is a fancier version of D11: the use of arithmetic obscures the critical role of tastes. For example, if the second last sentence in this answer were replaced by "If the price of apples rose to 2 then this consumer could buy 30 apples and 20 oranges with the same income." then this argument might lead a reader to think that a demand curve is upward sloping. Neither answer is convincing because neither reveals whether the

[40] University of Guelph Undergraduate Calendar, 2009- 2010, Section VIII

numbers are reasonable: what kind of tastes would lead a consumer to buy 40 apples and 30 oranges? And, more importantly, are those tastes also compatible with the behaviour displayed after the price increased? This style of answer is also weak because it cannot be easily generalized to environments with many more than two goods.

Calculations are often the easy part, especially after the arithmetic has been simplified to make the calculations easy. If calculation is not part of your competitive advantage then the lesson to draw from many business classes is that you should try to compete using your strength: ideas and words. In a broader context, attempting to use arithmetic and financial analysis in a context where values and taste are also important is a mistake commonly associated with high profile business failures and flawed business models.

C4 *If the price increases then the effect on quantity demanded depends on whether a consumer is willing to shift money within the household's budget to offset.*

C4 This answer shows that the answer depends on something about money (as evidenced by the word "budget") and on something about tastes (as evidenced by the word "willing"). But this answer also attempts to offer an arithmetic answer that is narrowly focused on a single good. A true understanding of behaviour would use some aspect of indifferences curves or a utility function to show how to resolve the trade off inherent in a consumer's choice. It would reveal whether the tastes for all goods are such that a consumer is willing to reallocate the budget.

C5 *An increase in the price might raise consumption of apples if the consumer was willing to consume fewer oranges but if the consumer was not willing to do so, then the limitation on income implies that the consumption of apples might fall.*

C5 This answer reveals that the income constraint and preferences matter. But the link is unclear. It fails to understand that preferences for apples are connected to preferences for oranges (i.e. the marginal rate of substitution and the trade offs are at the heart of many decisions). It does not understand that this answer is generally true regardless of prices and does not use any information that would be implied by the consumption chosen before the price increase. Specifically, it fails to use the idea that consumers are goal oriented so that a consumer chooses the bundle of apples and oranges that best meets their tastes. Without an understanding of the "before" situation, this answer fails to use the ceteris paribus assumption or comparative statics analysis appropriately.

C6 *Since people need to eat, they will buy what they need regardless of the price. Therefore, the demand curve is a vertical line.*

C6 The idea that food is a necessity is well documented and is reported in many textbooks. The weakness of this logic is that the fact is asserted for the category of food in general. It is not true that people need to eat apples. It is not true that they always need to eat the same number of apples.

This answer also hints at a better answer since the formal definition of "necessity" in an economics class is that the income elasticity of the good is low: i.e. between 0 and 1. This hint establishes that apples are a normal good, that the writer is aware of some of the terms used in the classroom and that they have made a weak connection to the income effect described in the A answer.

Making a direct connection would be better because the words "need" and "necessity" are frequently abused. The word "need" is widely used in business or marketing classes but, even in those classes, some students are confused by the concept (e.g. the comment "I *need* to have the newest iPod!" seems to become less common when parents stop paying the bills). The specific problem with the word "need" in an economic class is that it often fails to account for the quantity margin of a choice.

If the question used a "cure for cancer" in place of "apples", then some students may

strongly assert that the demand for life-saving medical drugs is perfectly inelastic. This assertion is well-intentioned but inaccurate. Many people are willing to give up their life for some things (e.g. a child, a parent, a principle). Even if they do not intend to give up their life, they may take their medicine less often than their doctor recommends: i.e. perhaps ignoring the price but not ignoring serious side effect, they may reduce the *quantity* on the *margin*. A simple understanding of such behaviour is contained in an A answer and is overlooked by the assertion in this answer. The assertion may also confuse the concepts of intended behaviour and ideal behaviour. Ideally, everybody's cancer should be cured but identifying the cost of doing so would reveal why a good answer needs to discuss the significance of a budget constraint even before the price changes.

C7 *The answer depends on the size of the price increase. Consumers do not react to a small price change because income is sufficient to cover the extra expenditure. A consumer would react to a larger price increase either because the larger price increase makes current consumption patterns unaffordable or because there is a critical price level where a consumer would stop buying apples and use the money to buy something else.*

C7 This answer, like all C answers, mixes some good ideas with some confusion about basic principles. This answer is correct to focus on the critical role played by income and tastes. It notes that the balance between total income and total expenditure is an issue and it notes that a consumer may substitute to an alternative.

This answer is a vague about some of the details. First, the balance between total income and total expenditure always changes when the price of a good changes, regardless of the size of the price change. The A answer noted that it may be possible to offset this imbalance by adding to or making withdrawals from savings, but the A answer excels by showing that an opportunity cost is associated with this margin of adjustment.

Second, this answer suggests that the demand curve look like an upside-down L where people will buy if the price is less than the critical price and not buy if the price above the critical price. This perspective of demand in terms of transactions misleads many people. "Demand" represents a flow over time, not based on a single visit to a store. The transaction perspective focuses on sales or production where the question asks for insight on consumption or demand by consumers.[41] This perspective overlooks the many small ways in which a consumer can adapt their consumption: e.g. even if they only buy "one", a consumer could buy one apple, one pound of apples, or one kilogram of apples. Third, even if the demand curve looks like an upside-down L, the question asked about the market demand and different individuals may have different critical prices. When these differences are combined into a single market demand curve, that curve can be surprisingly smooth.

Some people may think that this answer expresses a non-rational theory of behaviour called satisficing. According to this theory, people do not use the optimizing ideas presented in the A answer but make choices that are "good enough". Some evidence supports this theory but what follows the word "because" in this answer shows that the satisficing theory is not being considered. Even if this theory did use a satisficing theory, and even if nearly all decision makers are choosing something more than minimally acceptable, when the decisions are added up across many consumers, it is virtually guaranteed that somebody will be on the threshhold. Also, the change in price might cause other consumers to change their idea of what quantity is

[41] Some answers use phrases like "Quantity demanded varies with availability". Because this answer does not really explain what the behaviour would be independent of "availability," using this phrase is an example of Bad Style F. Such answers also suffer from the same misleading focus on the quantity purchased rather than the quantity that a consumer intends to buy. Stating a definition of quantity demanded, just as stating other definitions in response to other questions, helps a writer because it tends to clarify such important issues.

"good enough".

D: D1 *If the price of apples falls, then apples become more affordable. Hence, people buy more apples.*

D1 What does "affordable" mean? Though this word is often used in a political context, its meaning in the context of tastes or income is unclear. Therefore this answer is consistent with a good answer but it is not connected to a good answer.

If a consumer buys apples then the evidence implies that affordability, in its most basic form, is not an issue for this consumer; it cannot become *more* affordable. If a consumer does not buy apples then apples might be unaffordable (in a sense yet to be defined) *or* this consumer might choose to spend their money on something other than apples. Quantity demanded represents the quantity that consumers are willing *and* able to buy where the clear meaning of "willing and able to buy" presented in an A answer is vague in this answer. It is not made clear how many apples are being consumed: most people have enough income that their budget constraint allows them to buy at least one apple if they want to.[42] A good answer would understand the important difference between what a consumer prefers and how they behave.

A good answer would also recognize that, even if everybody has the same income, not everybody would behave the same. Since this answer focuses on affordability as though that issue were relevant to everybody, it fails to recognize the difference between an individual demand curve and a market demand curve.

D2 *Demand curves may or may not slope downward. It depends on tastes. A change in price might increase purchases but it could also lead consumers to perceive the apples to be low quality, which would cause them to buy less.*

D2 This answer suffers from several problems. To some people, this answer seems wise, since it claims to demonstrate an awareness of the role of perceptions. But that wisdom is misleading in an economic context, and especially for a good like apples.

The problem that should concern the student is that the answer emphasizes tastes but should have been emphasized is what a consumer infers from the price. This answer is a D answer because the asserted link between price and perception is unstable. An A style answer, which would result in the same answer, would show what[43] needs to be added.

Essentially, this answer argues that the answer is ambiguous and that the ambiguity cannot be resolved until the behaviour is recorded in historic data. This kind of answer is operationally irrelevant because, by that time data is available, it is be too late to make a decision.

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[42] As another example, you may think that you cannot afford an expensive car, like a Rolls Royce or a BMW on a student's budget, but some thought shows that you could if you wanted to: specifically you can rent it for a day (e.g. for a prom or graduation party). Some people may argue that they do not like it because the price is too high but that comment confuses the separate roles played by preferences and by budgets when studying consumption decisions.

[43] Making inferences based on the price is an example of something that could be true but the answer is not necessarily convincing because it is not completely true. In order for a consumer to infer something about quality from the price, there must be some information that can be revealed by the price and *only by the price*. For many goods, the brand name, a willingness of a seller to guarantee satisfaction, direct inspection of the good or a marketing strategy which asserts "new and improved" can reveal more about the quality of the good than the price. Another problem with this style of answer is that the supposed link between price and quality is useful to answering this question only in the sense of being one of many possibilities. This style of answer is not constructive or consistent with broader issues because, in the real world, a consumer may use the price to infer other conclusions (e.g. cost of production, competition). If these other conclusions could affect this answer or if different consumers would make different inferences then a serious answer would have mentioned them.

A better answer would also understand the difference between an increase in the market price (i.e. the prices of all firms) and an increase in the price by a single firm, where this question focuses on a change in the market price.[44] If you do not recognize the difference then you do not understand how an economic class adds to what your other classes are teaching and you do not see why economics is a required course for students in many disciplines. Failure to recognize important ideas fulfills one of the common definitions of a D grade.

Finally, this answer might annoy a marker because the question did not ask "Does a change in consumer perception affect quantity demanded?".

D3i *The effect varies from one consumer to another.*

D3ii *It is impossible to say since so much information is omitted from the question. If I were a market analyst trying to predict sales of apples, I need to know the price level of apples, the price of oranges, the distribution of income, psychographic information on the motives of consumers, demographic information as well as information on the relationship between the places where consumers shop and the distribution channels used by apples growers.*

D3 This answer tries to answer a question asking about a movement along a demand curve by stating a list of things which would shift a demand curve; a distinction which took up a large fraction of class time before the test because it is important. It also tries to answer a question which asks about the direction of an effect (i.e. upward sloping vs. downward sloping) by asking for information which *might* give insight into the magnitude of the effect (e.g. an elasticity of 0.5 or 2.3). The answer also confuses the notion of a market demand curve with that of an individual demand curve.

Answer ii is slightly better than answer i because ii provides a list of what differences might be important but this answer is not much better because nowhere in that long list does the writer make a connection to the question. An easy way to improve this answer would be to demonstrate how the supposedly-necessary information would be used to change the answer if it were provided. In more advanced classes, many students face an obstacle because they try to use such information to predict quantity demanded perfectly but have trouble distinguishing relevant data from irrelevant data and have trouble recognizing the consequences of omitting a critical bit of information.

See also Bad Style D2 and answer D7 below.

D4 *Every price change affects the consumption of all goods. Thus, whether an increase in the price of apples increases consumption of apples depends on whether the effect on apples is more or less than the effect on oranges.*

D4 This answer tries to argue that a change in price has more than one effect and that the net effect depends on which of these effects is stronger. In this case, the logic is flawed because the two supposedly-independent effects are connected: the consumption bundle containing both apples and oranges is chosen simultaneously by the same consumer and is paid for with money coming from a joint budget constraint.

The A answer contains two independent and potentially-offsetting effects but the A answer is more convincing because the answer continues and identifies a simple bit of information (income elasticity) which helps to distinguish which effect is stronger. An interesting A answer would start by explaining how to use the standard economic answer, then note an interesting addition to the standard answer and finally note a way to identify which effect

[44] An adventurous answer could discuss the associated risks and be able to indicate conditions when those risks are either high or low. This discussion would focus on the forces of supply and demand where the only sustainable perceptions are those which are compatible with an equilibrium: in a meaningful sense, perceptions do not vary independently.

dominates. A simple statement that quantity demanded could rise or fall, regardless of the fancy language, offers little insight.

D5 *It depends on why the price changed.*

D5 This answer confuses a "shift of" and "movement along" a demand curve. Suppose that you thought that the answer differed depending on whether the price change was caused by an event on the supply side or an event on the demand side. The demand curve may change because of a change in income or taste which would change the equilibrium price. But the words in the question define it to look at the effect of a price change on quantity demanded, ceteris paribus. The answer does not depend on knowledge of the supply side because the demand curve is defined to represent consumer behaviour only.

Further, even if the (equilibrium) price changed because of a shift of the market demand curve, it is not true that the demand curve for every consumer changed. Thus, using this style of confused answer may indicate that a student is also confused or lazy about the relevance of a fundamental concept that is discussed in courses offered in many departments: customer segmentation. And, since a nearly identical question can be asked concerning the supply side of a market, such confusion may also indicate confusion concerning the relevance of another fundamental concept: competitive advantage.

D7i *The answer depends on whether income increases enough to offset the price increase.*

D7ii *The answer depends on whether the price of competing goods and services adjusts to offset the increase in the price of apples.*

D7iii *The answer depends on how tastes change in response to the price change.*

D7 These three answers confuse the definition of a demand curve and are confused about the usefulness of the comparative statics methodology of analysis. Many students complain about the irrelevance of this methodology but this methodology is critical when the analysis starts to use data from the real world. If confronted with evidence of an increase in sales, people need to learn how to identify the separate contributions of many different changes in the environment before deciding whether the increase in sales was due to the wise choice of a decision maker (that should be continued) or a lucky change in the external environment. Because instructors want to prepare students for future challenges, the comparative statics methodology is used in the beginning.

Answer i can be expanded usefully but adding precision would reinforce the usefulness of the comparative statics methodology and would invoke the use of numbers which, some students claim, is of little use. It is vaguely true that an increase in income can offset a price increase but it is not precisely true. Some students may argue that if the price increase raises total expenditure by $10 (assuming no change in the quantities) then the necessary increase in income is equal to $10. More careful analysis or thought would show that, according to the income elasticity, only part of the $10 increase in income would be spent on apples and this fact implies that the offsetting increase in income needs to be larges. A better answer would apply price and income elasticities: if income elasticity is equal to n and price elasticity is equal to e then the total percentage change in quantity demanded (PC q^d) from these two changes is[45]

PC q^d= e* (PC price)+ n* (PC Income)

[45] In a precise sense, this formula can be proven to be approximately true for a range of prices, income and other variables using a Taylor Series Approximation and some concepts from calculus. But, since a surprising range of people think that the answers to economic questions already use too much math, exploring this detail is typically delayed until a student has learned more concepts. Unfortunately, many of the people who are convinced that the answer is wrong cannot take the next step and discuss whether the Approximation over-estimates or under-estimates the true answer in a particular example.

Therefore, to establish PC $q^d = 0$, some high school algebra shows that the necessary percentage change in income is e/n times the percentage change in price, not \$10.

Answer iii also represents confusion about an important idea in economics: the difference between tastes and the behavioural implications of tastes: behaviour can change even if tastes do not change.

Some students are unhappy with the comparative statics method of analysis and argue that, in the real world, the concept of a demand curve is unimportant because more than one thing changes at a time. While it is true that the price of apples, or oranges, of cars, changes at the same time as income and the quality of local restaurants change, these facts have nothing to do with the narrow question that the student is expected to answer here. Plus my experience is that a student who has trouble answering this specific question, which should be expected in various disguises in tests in many types of classes, also often has trouble answering a harder question like

> "Does an increase in the price of oranges increase the quantity demanded of apples by the market?"

even though answering that question requires a student to use essentially the same mental machinery. Such students may expect real-life questions to be easier but they will find them harder because the students are not yet aware that much of the information they want is available but hidden, that irrelevant information will be included and needs to be excluded or that, especially in the context of a business plan, some people have an incentive to actively try to persuade them of the correctness of a wrong answer.

D8 *The answer uses information on income and tastes.*

D8 How is this information used: added, subtracted, or exponentiated. Should we compute a ratio of income to tastes? Do consumers maximize income? Because this answer omits answers to these and other questions, the student is asking the instructor to fill in a lot of missing pieces before finding an answer.

D9 *Quantity demanded is found at the intersection of these two lines (see picture …). One line represents the influence of tastes and the other line represents income. Because a change in the price shifts the second line to the right, quantity demanded rises.*

D9 The most likely cause of this confused answer is confusion between the supply and demand graph and the graph used to explain individual choice. A picture is worth 1000 words and both pictures are widely used in an economics class but they are used to answer different questions. This picture is often further confused because it is not labeled; adding labels is often useful as part of story-telling and adding labels while writing the answer would have revealed which graph is relevant. The question asked here asks for a discussion of the meaning of the demand curve on a supply and demand graph.

It is possible to answer a question without using a graph but only if you can remember all aspects of behaviour in some other way. Remembering all aspects is important because many weaker answers occur unintentionally when a student forgets during the test what they thought they would remember. Instructors spend time teaching the most important ideas because experience has shown that those can be easily forgotten by smart people who have many years of experience.

A surprising number of students are intimidated by graphs. Their future life and any future business career would be much less intimidating if they understood that a graph is not some sort of mathematical voodoo: each line tells a story and class time is spent trying to explain the many levels to a story. Especially in an economics class, lines on a graph are usually intended to remind you of some aspect of behaviour, such as quantity varies in a particular way with price or cost varies in a particular way with quantity.

D10 *If the price falls, I would buy more apples if I had more disposable income.*

D10 This answer confuses income, which is assumed to be fixed, and total expenditure. If there were no change in the quantity demand of any good then a decrease in the price of apples would leave some extra cash for the consumer to spend on something and an increase in the price would make it impossible for a consumer to buy what they had intended to buy. To resolve this change in plans caused by the difference between total income and total expenditure, a good discussion needs to recognize the role played by tastes.

D11 *Assuming that people spend a constant fraction of their income on apples, then p* QA= Z* Income.*

for some fraction Z. Thus if p rises then QA must fall.

D11 Effectively, this answer attempts to convert a conceptual question into a measurement question. This answer is a D answer because the added assumption also adds the implication that income elasticity and price elasticity are both equal to 1. These implications are routinely contradicted by data. Students should recognize this fact because the link between price, expenditure and elasticity is commonly taught in economics, marketing and accounting courses. This answer also overlooks the fact that the market demand curve represents the behaviour of many consumers with differing incomes and tastes.

A better answer cannot start by declaring that the price elasticity is equal to 1 because doing so assumes the conclusion to this question. A better answer might start by assuming that the income elasticity is equal to 1 and then show why that assumption is useful; this approach is better because, if the argument is clear, then a reader should be able to substitute "1" for any other number that they think is realistic and derive a more realistic conclusion.

Some people think that (p* QA/Income) is constant. This perspective is dangerous because it leads people to think that any change in p* QA/Income represents a change in tastes. This number, which is sometimes called the "share of the wallet" or "the expenditure share", can be computed but this number may vary as the market conditions vary: i.e. if price varies.[46] Because consumer analysis aims to explain why this share changes, starting the analysis by assuming that it is fixed is very dangerous.[47] More generally, students should find it easy to think of examples where a change in sales, as measured by quantity, moves in the opposite direction to a change in sales, as measured by consumer expenditure or a firm's revenue.

D12 *No, the demand curve for apples does not slope downward. A rational consumer would choose an optimal quantity. If the price changed, that optimum would not change. Therefore, the quantity demanded does not change.*

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[46] Some people suggest that if p Qd/Income were constant then it could *not* satisfy the ideas of tastes and budget constraints as explored in the A answer. In fact, a popular functional form known as "Cobb-Douglas" could be used as a utility function by a selfish consumer to produce exactly this relationship:

$U(QA, QO)= QA^{A}* QO^{(1- A)}$

where QA represents the quantity of apples and QO represents the quantity of oranges.
Ariel Rubinstein noted this fact in his research on bounded rationality. Peter Morgan, in his critique of psychological studies of pigeon behaviour, also noted that some types of behaviour that appear to be incompatible with traditional economics are special cases of the standard answer. The lesson to a student answering any question in any course is that the answer provided should be as precise as possible because not all of the implications of an idea may be immediately apparent: an A answer excels by adding to the standard answer rather than replacing it.

[47] Some students use a variation of this argument where the answer depends on how much money a consumer has in their pocket at the moment of purchase. This answer is based on a suggestion that the money in your pocket is a kind of hard constraint that is strong enough to prevent certain behaviours. But the suggestion is misleading: credit cards, borrowing from friends, or using store credit all indicate that the constraint can be circumvented. And, even if a consumer has enough money in your pocket, they may be saving it for a future use. Thus, having money in a wallet is neither necessary nor sufficient to the decision. A bit of thought reveals that how much money a person keeps in their pocket is a form of behaviour that also needs to be explained.

D12 This answer reveals a fundamental confusion, which is also widespread. People may be rational and may make decisions that are optimal in some sense but people do not optimize the consumption of apples alone. The optimal consumption bundle needs to recognize the trade off between apples and oranges at least.

This answer also represents a common abuse of language that misleads some students: a quick inspection of data would also show that people do not *optimize* their consumption of any *one* good because this optimal solution would imply that a consumer spends all of their income on that one good. They do not act that way because apples are not the *only* important good to be consumed and a true understanding of consumers would reflect that fact.

In my opinion, business students seem to like the words "optimize", "maximize" and "minimize" for reasons that have nothing to do with economics. For example, it is not too hard to get a business student to say "We will optimize profits by maximizing quality and minimizing cost." More experienced people recognize that optimizing profits is a goal which may or may not be attained, that maximizing quality usually involves increasing the unit cost of production and that the way to minimize cost is to shut down. Replacing the word "maximize" by "increase" and the word "minimize" by "decrease" would change little in the direction of the activities but would recognize the importance of concepts like marginal cost, marginal revenue, marginal rate of substitution. Therefore, the answer would display a deeper understanding of the real world.

D13 *Some consumers buy apples for their families and have no choice.*

D13 This answer is similar to answer D12 in that it asserts a narrow view of the consumer's decision. It may seem reasonable if you think that the tastes of this type of consumer in this situation cannot be represented using the standard tools. But, if those tastes can be represented using the ordinary tools of analysis, then this line of reasoning is irrelevant. In fact, buying goods or services for others does not eliminate the choice problem (e.g. think about all of the choices made at Christmas time or for a birthday, and the time and money expended on such gifts). And the purchaser may be motivated by their estimate of what others want rather than what others truly want (e.g. think of all of the gifts that are returned during the week after Christmas).

D13 *If the seller offers a volume discount then loyal customers would buy more to take advantage of it.*

D13 This answer avoids answering the question as asked by trying to replace it with a question that sounds similar. It adds the idea of a volume discount, which could explain a price change, but this answer does not use the idea that the price changed. To be consistent and to use the ceteris paribus assumption correctly, it would be better to investigate the effects of a change in the volume discount policy. Second, this answer focuses on the supply side rather than considering consumer behaviour. Third, the answer discusses "loyal customers" but ignores other customers and other potential consumers. Thus, this answer does not provide enough insight to show whether it is a good idea to offer a volume discount.

D14 *The answer depends on the distribution of consumer types. Some types eat only one apple per day and others eat many more. The types which eat only one do so because "an apple a day keeps the doctor away" and these health benefits do not vary with the price of apples. The other types may or may not react to a price change depending on their motivation.*

D14 This answer offers some insight into the idea that the market demand curve aggregates the decisions of many consumers. The weakness of this answer is that it seems to define a consumer's type according to how much he or she buys. Since this decision typically varies with the price, using this style of answer has the effect of arguing that a change in price changes the types of consumers. This answer also asserts that preferences vary with prices

whereas the economic model shows why it is more useful to argue that prices affect the ability to satisfy one's preferences.

The answer hints at a something better by talking about the motives to consumer apples, e.g. health, as a way to identify a range of consumer types. Unfortunately, this answer starts by asserting a dominant motive and does not follow the hint by showing how this motive can be reconciled with other motives or by discussing the trade off created by conflicting motives that would need to be resolved in a consumer's choice with a fixed budget.

F: F1i *Yes.*

F1ii *No.*

F1 A change in one word is not enough to change a weak answer into an strong answer. Plus, this question is not in the multiple choice format. If the question were asked using a multiple choice format then some students would complain that none of the answers provided express what they want to express. Therefore, it is doubly surprising to see a university-level student offer this kind of answer and not take advantage of the extra space allowed.

F2 *The answer is obvious.*

F2 If it were so obvious, we would not ask. And, given the number of times in a day that people assert that demand curves are not downward sloping, this characteristic of a demand curve is not obvious.

F3 *In my opinion, no. If the price fell, the quality perceived by consumers would fall and quantity demanded would fall.*

F3 This answer is weak for many reasons. First, few people are interested in opinion, yours or mine. Some students seem to use this style of answer to be friendly (in which case, the opening sentence is neither weak nor strong), or to hide what they do not know, or to be consistent with their self-image as a CEO-in-waiting who will be asked to make decisions quickly based only on the limited information available. If instructors used the last perspective to assign grades then the grade for this answer should chosen by some kind of coin flip which matches the uncertainty inherent in the available information to uncertainty in the real world. My guess is that most students are not willing to gamble with their grades in this way. Further, if they changed their answer based on this new grading incentive, then it would reveal that they did not believe in their first answer: it deserves an F.

This answer is weak for reasons that indicate the writer is not ready to be allowed to make executive decisions. First, the answer does not clarify the concept of a demand curve. As discussed elsewhere, a demand curve is not the historic relationship between price and quantity. Thus, the writer is asking the instructor to fill in part of the answer.

Second, it is not explained why the perceived quality would fall. If this question were assigned after some lectures on consumer behaviour, a better answer would add information discussing the process consumers use to infer quality. The addition is important because it is not true of all markets and because good marketing students should be able to identify strategies to reduce or eliminate this negative inference from prices (this strategic discussion should be expected if a student sincerely believes that the ceteris paribus condition is not useful). To link price and quantity demanded, one would need to add an explanation of whether the decrease in price more than offsets the decrease in perceived quality: many people are willing to buy lower quality material if the price is "right".

If this question were asked on a final exam after some lectures on a market equilibrium then the grade assigned to this answer would be even lower: the most natural way for a consumer to infer quality from price is to compare this price with the prices of competitors. In this context,

the answer considers excess supply: is the decrease in price is due to a decrease in cost or a transition from one equilibrium to another? This answer is not as good as D2 because it asserts what answer D2 identifies as one of many possibilities. Neither answer identifies a way to distinguish between these possibilities. A change in quality is not the only or even the most likely explanation of the change in price.

F4i *Yes, because an increase in price decreases quantity demanded.*

F4ii *No, because an increase in price increases quantity demanded.*

F4 This answer reveals the definition of the demand curve implicitly but asks the instructor to fill in the explicit definition. Given the number of people who debate this definition, and given the amount of class time spent on the subject in various courses using various disguises, stating the definition implicitly is not good enough.

Version i of this answer provides what is usually regarded as the correct answer while the second version includes only a minor change. Since the major contribution of either answer is to rearrange the words in the question, it is not very useful. It is not connected to anything but itself. Therefore, unless you already know the answer, either F4i or F4ii could be right.

F5i *Data shows that whenever the price falls consumers buy more of that good.*

F5ii *The evidence shows that some people may buy apples when the price is high and some people may not buy even if the price is low. Therefore, it is impossible to identify a clear link between price and consumption.*

F5 Trying to answer a question based on "evidence" is dangerous in the case of a time-limited, sit-down test for one reason and one potential reason. The potential reason is that most class time was probably spent investigating concepts and not data. A fair test would not ask you to remember an obscure disconnected comment that was discussed for less than one minute.

More relevant for this question is the idea that many people dispute this "evidence". A good answer would understand the nature of this dispute but this choice of words in this answer shows that the writer does not understand the importance of the ceteris paribus condition implicit in the definition of the demand curve: the question does not focus on the statistical question of the correlation between price and quantity. A failure to separate supply forces from demand forces implies you will not realize when the correlation in the data is unstable. Further, and this is a reason why economics classes study supply and demand separately, failing to separate different forces makes it more difficult to understand whether any price change is permanent and makes it more difficult to determine when the magnitude of an effect is expected to be large or small.

Even if people do not dispute the evidence for the past, they may dispute its relevant to the future. The four most dangerous words in research are "this time it's different" and they are dangerous because they asserts that past patterns are irrelevant for the future. While there are risks with using historic data, one common pattern is that suppliers cannot raise price and expect quantity demanded to change in a way that always benefit the supplier. The change might benefit the supplier but the A answer identifies powerful reasons why the opposite is more likely.

This answer also illustrates an issue which frustrates academics and is commonly displayed by business gurus who sell lots of books. Typically, a business guru wants to claim some new insight (Excellence, the Long Tail, …) and, to be convincing, uses examples to illustrate how the insight leads to spectacular success in action. Academics argue that these few examples can confirm an idea but they cannot prove that it must be true; a two page discussion in a best-selling book or a one paragraph discussion in a textbook cannot rule out the possibility that success was due to luck or due to some other (but unmentioned and perhaps ordinary) idea. Or, even worse, the guru displays a logical fallacy known as *post hoc ergo propter hoc*: by selecting examples after the success has been documented, the style of logic is unreliable when

applying the insight to the future when the level of success is not yet known. Since the guru has selected the examples, a careful reader should wonder whether those examples are part of a pattern or will another guru select other examples to confirm an opposing insight.[48] This fact may explain why few business gurus survive at the top for a long time: Peter Drucker and Michael Porter are exceptions.

An impractical solution would have a student who provided this answer debate a student who provided an opposing answer, or answer F3, to see who deserves the higher grade and who deserves the lower grade. This solution is better because it focuses attention on the quality of the opposing answers.

F6 *According to Maslow's Hierarchy of Needs, apples fit onto one of the lower levels of the hierarchy (i.e. necessities of survival). Because the apple industry is also a mature industry, the Product Life Cycle is in its final phases. Because of both of these reasons, producers cannot afford to raise prices or lower prices.*

Some consumers, especially the "early adopters", may investigate innovative products that use apples but the effect on consumer purchases depends on their habits and on whether producers use a penetrative pricing policy or a policy to scoop off the rents from high income parents buying for their children. Therefore, and even though McDonald's, which is the world's largest buyer of apples for its apple pies, represents such a small share of the market, the effect of such innovative products is too small to notice.

F6 There are so many problems with this answer that it is hard to know where to start. Though the grammar is poor, the essential problem is that no sentence is connected to any other sentence. The answer uses words like "because" and "therefore" but these words could be omitted without changing the sense of the answer. The analogy I encourage reader to think of is that it is possible to cross a river on the backs of crocodiles (Bad Style I1) where you have to run very fast and no step can be misplaced.

Second, the missing connections within the answer are evident in the fact that it contradicts itself by saying that the price cannot change and that it can.

A focus on connections would reveal that the many buzzwords are either being abused or are irrelevant.

i) Maslow's Hierarchy of Needs is a widely used theory of taste and this answer could be made better by noting this connection, since most textbooks do not discuss its connections to price changes. Strictly speaking, Maslow's Hierarchy is not very useful in many economic contexts because a hierarchy does not permit trade offs between the levels. Asserting Maslow's Theory does not produce a complete answer because behaviour depends on tastes and the budget constraint.

ii) It is asserted that the apples industry is in the mature phase but no evidence is given. Therefore, the second sentence repeats itself: it may or may not be true but it is not connected to the question. If it were true, a good answer would identify whether this fact makes a difference.

iii) The emphasis on early adopters ignores the fact that the question is asking about the market demand curve, not individual demand curves.

iv) Mentioning McDonald's could be innovative because they are a business buyer of

[48] The most careful discussion of the difference between confirmation and proof is in a statistics course when the instructor introduces the difference between Type I error and Type II error. But many students dislike such courses and, as I have noted elsewhere, this dislike leads to conceptual barriers when trying to discuss risk. Personally, I prefer Nassim Taleb's book entitled *The Black Swan* (http://www.fooledbyrandomness.com/) because it emphasizes the idea that people, especially people in business, fail to recognize the logical and strategic significance of atypical events.

apples (for reuse and resale) as opposed to the final consumer usually discussed in class.

The fundamental weakness of this sentence is that it asserts that the magnitude of any effect is small even though the question is asking about the direction of the effect. Buzzwords can be useful in some contexts but they are most useful if used appropriately. This example illustrates how using a buzzword inappropriately may reveal a misunderstanding.[49]

F7 *If the price fell, competitors would match the price and the seller would lose its competitive advantage. Once all sellers charge the same price, no seller increases its market share.*

F7 This answer tries to replace the question as asked with a different question: instead of focusing on quantity demanded, the answer focuses on market share and the supply side. This answer misleads because, even if market share does not change, the reasons given in an A answer would show that the quantity demanded of all sellers would tend to rise and this fact would cause the quantity demanded of any one firm to rise. Second, by explaining how sellers choose a price, this answer invokes some of the ideas associated with a market equilibrium without actually solving for an equilibrium.

Third, this answer misidentifies a low price as competitive advantage. Since a low price can be copied, it cannot be a competitive advantage. The most relevant advantage is a low cost of production and knowing whether this advantage exists would reveal whether competitors would actually match the price cut. Therefore, even the basis of the substituted question is flawed.

F8 *An increase in quantity demanded reveals that consumer tastes must have changed, regardless of the price.*

F8 This answer asserts the "wrong" answer and this assertion might be the result of poor organization. The phrase "regardless of the price" implies that a change in price cannot have changed quantity demanded. Thus, without explaining why, it asserts that the demand curve is a vertical line (i.e. perfectly inelastic). More thought would have shown that this assertion is not always true because it becomes impossible if income is low enough.

This answer is poorly organized because it starts with the conclusion (change in quantity) and tries to find a link to a cause (change in taste) as though that cause were the *only* possible cause. Because arguing in reverse focuses on a conclusion, this style makes it more difficult to identify the multiple connections needed to reach that conclusion. My advice is, before answering any question, spend a couple of moments to think about whether other possible answers are excluded.

F9 *Yes. But a decrease in income would decrease quantity demanded, if apples are a normal good. Therefore, the net effect on quantity demanded depends on which effect is larger.*

F9 This answer is weak for a subtle but surprisingly common reason: the answer does not actually explain why the answer to the question is "Yes". A generous interpretation of the third sentence would be that it appears to understand the idea of the income and substitution effects but, without a more convincing connection and because this answer uses an improper definition of the income effect, I think that a more likely interpretation is that that answer is confused. The correct definition of an income effect focuses on the effect of a change in *real* income *associated*

[49] Different courses uses different theories and the answers provided here should be completely familiar in an economics class. Many students who are highly skilled in one department are also required to take courses in other departments. If you want to try to use expertise gained from one department in another class, please do so. But a good answer would list the formal title of the unanticipated theory and would list a supporting argument. Good answers use buzzwords appropriately and draw the connection.
Good instructors are aware of a wider range of ideas than are contained in their lecture notes while weak students will try to assert authority that has not been earned.

with a price change. The second sentence makes it clear that this answer discusses a completely different question.

As noted in Bad Styles F or I above, many students seem to prefer to focus on something else. In a business setting, your future boss will be more interested in an ability to construct an answer than in an ability to show why everybody else's answer could be wrong. Because your answer may or may not be right, you will need to defend it (i.e. explain it convincingly) and you will need to live with the consequences of implementing your answer. It will not be good enough to say that "I do not want to say whether this strategy will increase sales but I am sure that an increase in consumer income would increase sale (if it will happen)".

F10 *Yes, because an increase in the price decreases a consumer's taste for apples.*

F10 The confusion displayed by this answer illustrates why the analysis of consumer behaviour benefits from discussing the budget constraint and tastes separately. It is true that an increase in the price of apples shrinks the budget set but this shrinkage does not change tastes; this shrinkage changes the ability to satisfy those tastes.

The essential problem with this answer, which also appears in answer D5, is a confusion between the forces which shift a demand curve and the forces which cause a movement along a demand curve; both are important but for different reasons. It is true that a media report which identified more health benefits for apples would be expected to cause more people to buy more apples. And it is true that, after buying apples, a consumer could name the dominant reason why they bought (e.g. health concerns, crunchiness, juiciness, fond memories of childhood, …). But that statement represents ex post rationalization and is incomplete:[50] the stated reason appears to dominate only after the outcome is known. Before the outcome is known or if the consumer is placed in a different situation, research may identify other motives influencing a consumer. The balance between competing motives is important because many products are either healthi*er* or crunchi*er* or juici*er* (but not necessarily all three) than apples and not chosen. A price increase does not change these motives but a price increase may lead to a situation where certain motives continue to exist but no longer dominate: a good analyst would consider all relevant motives even if they do not dominate.

Economists rarely name the different motives which determine behaviour because trade offs are more important to economic analysis. Therefore, the concept of the marginal rate of substitution is the most appropriate and operationally relevant tool when seeking to understand how the quantities of many different types of goods and services adjust to satisfy those motives. Differences in the relative strengths of these motives may help to distinguish consumer types.

F11 *Apples are a normal good that all children grow up with. Therefore, a decrease in price increases demand. But since not all varieties of apples are normal, it is possible that the demand curve for some types of apples have abnormal shapes.*

The health benefits of apples as shown in the well-known saying "an apple a day keeps the doctor away." Since apples are a lower cost substitute for going to a doctor, people buy apples. That explains the shape of the demand curve.

Apples are also popular with teachers and, if I pass this course, I promise to bring you a fresh apple every day. Personally, I prefer oranges.

F11 This answer is longer than the others and is confusing because it does not progress from a clear beginning to a clear end. There is no particular grammatical error, although this style of answer often displays run-on sentences.

[50] Another reason why this list is incomplete is because it focuses only on the motives related to apples and ignores the motives relevant to other goods or services that compete within the budget constraint. These other motives are relevant to the consumer, if not the producer, and should be considered.

i) The sentence which starts with "Therefore, …" would be an excellent sentence for the end of an answer but it is at the beginning and the following sentence implies that the rest of that sentence is not always true.

ii) The word "normal" is used in different places to express different ideas. Also, it may seem as though the word "substitute" indicates the relevant use of an important idea but the connection to the next sentence is non-existent. The use of the word "demand" in the second sentence should be replaced by "quantity demanded."

If the answer was right, there might be an interpretation that would make sense but, with bad hand writing, the reader is not encouraged to find it. This answer satisfies the definition of an F answer because it could not convince anybody who did not already agree with the answer.

F12 *No, because if people started to buy more then sellers would supply more, which would return the market to its equilibrium.*

F12 This answer confuses "demand" and "excess demand". This answer also introduces a context for a price increase and uses some specialized terminology but the relevance of this information is not made clear. Answer D5 shows why the supply curve is irrelevant to this question.

F13i *If the price increase is temporary, then the consumer does not need to change their consumption since the economic environment will correct itself. In the long run, economics teaches that the price will return to its previous level and, because nothing has changed, consumer behaviour would not change.*

F13ii *Historic dynamics in the apples market show that there is a cycle of price and quantity. Therefore, any effect would be temporary.*

F13 This answer adds an assumption concerning the timing of the price change and such additions are reasonable if they help to clarify the question. Adding the assumption that the price returns to its previous level is improper because it changes the question: if the price never changes then there is no way to investigate the slope of a demand curve.

The first sentence of answer i also represents a problem because no explanation is given concerning why the asserted consumer behaviour is reasonable. More thought may suggest that the temporariness would *increase* the magnitude of a consumer reaction, especially if the product in question, i.e. apples, can be stored. If a consumer knows that a price increase would last for only one week, then they might buy oranges this week, and consume apples left over from the previous purchase, or they might go without apples for one week. This argument works especially well if the price decreases because consumers can buy extra for storage (or apple sauce or frozen home-made apple pies) to take advantage of the temporarily low price. For other goods, such as gasoline, the magnitude of the reaction might decrease because, given more time, consumers can respond to a price increase by changing the type of car they drive (i.e. a fixed input). The added assumption suggests that time is important but the assertion needs to be better connected to behaviour as seen from the consumer's perspective, as opposed to what the seller wants.

If the question were asked after investigating a concept of a market equilibrium, some students may use this style of argument in the mistaken belief that each consumer must reduce quantity demanded, as a kind of boycott, in order to actively force the price correction. Economics teaches that the market price returns to an equilibrium for a reason and that it does not always return to the same equilibrium. If boycotts were effective at lowering the price, and since consumers always want lower prices, we should always see all consumers always reducing their consumption. But, individual consumers find it hard to maintain this behaviour for a long time since inconsistent with their tastes. Individuals can also use other tactics to complain about high prices in other ways, such as posting messages on a website, and, depending on excess

demand, retailers may respond. This reasoning shows why analysis of an equilibrium considers the behaviours of both buyers and sellers separately before investigating *excess* supply, *excess* demand or the interaction between the two sides of a market. This question is asking only about buyer behaviour.

Answer ii is a slightly fancier version which tries to introduce dynamics as something separate from tastes or the budget constraint. Mostly, introducing dynamics distracts from the central issue by improperly combining two questions: "does an increase in the current price decrease quantity demanded?" and "does an increase in the future price affect quantity demanded?" (Neither question is related to the magnitude of either the cause or the effect.) Both current and future prices are "prices", and if both were understand well-enough separately then any effects could be combined, but the definition of a demand curve focuses on the current price and current consumption. Some people argue that dynamics is a fixed (i.e. exogenous) feature of a market that affects the tastes of consumer but, in the context of a market, price and quantity are endogenous variables whose dynamic paths are explained by the interaction between supply and demand. It is true that history informs expectations of the future, which affects current behaviour, but history does not determine expectations. Many business planners want to know how consumers respond to the dynamics, especially when the dynamics change, in order to make profitable supply decisions. When the past does not continue into the future, investigating the causes and effects of such changes uses the same tools that are used in an A answer to this question.[51] Therefore, attempting to change the question in this way avoids the question that was asked while the A answer above includes the insight that is needed to understand the changed question.

F14 … *And there are exceptions to every rule.*

F14 This kind of statement is added at the end of many, otherwise good, answers. It is a version of the "CYA" answer (Bad Style D) because, after learning that the correct answer is the opposite of what the rest of the answer said, the student can appeal the grade by pointing to the sentence and say "I suggested that".

CYA answers display a lack of conviction but the wording in this answer offers a "teachable moment" about platitudes. It may be true that "there are exceptions to every rule" but it is also true that "the exception proves the rule." A weak student will not be able to identify the difference between the "rule" and the "exception" and, therefore, contributes little to a discussion. The platitude "the exception proves the rule" means that the "rule" has teeth in the sense that things vary. Thus, understanding variation is important. The ideas of comparative statics and of ceteris paribus are used because they help to analyse the cause and effect relationship at the heart of any variation.

This answer seems to convey the sense of wisdom that the some aspects of reality are not completely understood and that attending university will reveal those mysteries. The sense displayed in this answer is only superficial because a better answer would have identified at least one type of exception and would have connected it to the question. A careful reading of the A answer shows that some of these sources were discussed or could be added easily. Even better would be to display a sense of curiosity outside of test time.

F15 *A decrease in price would increase consumption of apples if the apples taste good.*

[51] Since expectations concerning prices represent the combined effects of supply and demand, and not of tastes alone, the ability to use these tools appropriately is a necessary part of the whole story but is not the whole story. It is interesting to discover what could change the dynamic characteristics of an equilibrium (e.g. the duration of a cycle or its amplitude or the rate of decay due to a random deviation from a "normal" steady state or its "deterministic chaos" properties), but enough students have trouble with the static characteristics of a market that discovering these aspects of dynamics is usually delayed or introduced in a restricted form.

F15 Consumers want to buy things which taste good. But that desire is always true. It might be nice if consumers know whether the apples that they will buy have any worms inside but making decisions on the basis of what *will* be known is unrealistic. If the issue was sufficiently important,[52] producers and retailers might offer a "no worms" guarantee or a "satisfaction guaranteed" assurance but similar risks are associated with any alternative and this risk is not directly connected to the change in price (see also the discussion of answer D2). Since this answer does not explore a *change* in the risk (which is almost the same as a change in taste), the issues of risk and of how good the apples taste are unimportant. Therefore, this answer can be simplified to the statement "a decrease in price would increase consumption", and it does not explain why.

A variation on this answer might explore how the use of a brand would change the answer or reduce the consumer's risk. The problem with approaching the question in this way is that apples tend not to be branded; a careful discussion of why apples are not branded in equilibrium might demonstrate an ability to go beyond the limitations of the textbook and generate some bonus points.

F16 *Personally, I would like to eat apples grown at home because they are fresher and use fewer chemicals. But it takes so much time and effort, and I took so much time preparing for this test, that I cannot do what I like. Therefore, I am forced to buy from the supermarket that exploits its workers.*

On the other hand, my friend grew up on an apple farm and she can talk for hours about the different kinds of apples, about the best way to take advantage of each kind and about her mother made ***the*** *best apple pies. She gets them for free and never buys apples from a store.*

I have another friend whose parents believed the adage that "an apple a day keeps the doctor away." She will buy apples at any price.

F16 This answer talks about tastes and cost in a very personal way but it does not make connections and offers no conclusion. This answer also illustrates why answers which focus on opinion can mislead: estimating a market demand curve based on the experience of three people is a very risky perspective: Are these people a representative selection of the market? Even if it suffices to understand the demand curve for apples, could the method of analysis be generalized to include other products?

The first two sentences of this answer and the second paragraph suggest that nobody buys apples from a store. If so then nobody would react to a change in the price. Given that people do buy from a store, the context reveals that the behaviour of these consumers is irrelevant to this question.

The third and fifth sentences indicate that not all trade offs are measured in terms of money. But the essential problem with this answer, and the reason why all the talk is irrelevant, is that the answer never discusses how behaviour would differ if the price changed.

The last paragraph reveals that tastes matter but, because the idea of tastes is identified so narrowly, its role is not entirely clear. The last sentence is also silly for reasons discussed in the commentary on answer C6 and D14.

F17 *Experts agree that demand curves slope downward.*

F17 This argument is based on the authority of the expert and using experts has two problems. First, if a different authority asserts a different conclusion, how would you decide

[52] More formally, a guarantee would be offered if it were consistent with a market equilibrium. While many non-economists may argue that markets are not in equilibrium, my argument suggests that it is possible to discuss how buyers behave when the situation is not sustainable but the discussion would offer little insight into the most relevant scenarios: as discussed above, the concept of an equilibrium provides a lot of contextual information that, if overlooked, can mislead people.

between them? Second, if no expert is available and you have to offer an answer, what answer do you give? In either case, students are at university to learn more so that, in the future, they can become the experts that others employ or criticize.

F18 *If the price fell to 0, then quantity demanded would be infinite. If quantity demanded were infinite then everybody would spend all of their time eating apples and this is silly. Therefore quantity demanded must stay the same.*

F18 If used appropriately, focusing on extreme cases is an example of a style of argument known as "proof by contradiction"; it can be a quick way to identify the necessary aspects of a problem. If used inappropriately, this style of answer offers little insight into realistic cases and produces an absurd answer.

The absurd part of this answer is to focus on the extreme case of a zero price. The argument is not convincing in this case because the implication (i.e. that quantity demanded becomes infinite) is not explained as the only possible consequence. A slightly better version of the answer would argue that the quantity becomes infinite because "more is preferred to less" and that a zero monetary price implies that infinite consumption of apples can satisfy the budget constraint. The absurd answer is a consequence of the sudden introduction of a time constraint that was not previously considered. As discussed above, an A answer could go beyond the textbook answer and show how to combine the idea of tastes and a budget constraints (based on time or other kinds of non-monetary costs) to show that quantity demanded would not be infinite.

This answer is weak because considering a different extreme case could have produced a different conclusion; if the price rises to infinity then the budget constraint implies that quantity demanded of apples must become zero (for any tastes). Consequently, the demand curve would be seen to be downward sloping.

F19 *If the price increased then the government can either force sellers to reduce the price or it can decrease taxes so that the price does not change.*

F19 This answer hopes to resolve the question by adding an independent outside force and is a weaker version of answers D7, C3 and C4. It may be true that the government should regulate prices or taxes on healthy food but a good answer would discuss whether that conclusion it is true regardless of the price level. (Hint: economics classes talk about this issue and the analysis is intimately connected to the characteristics of the demand curve that should be discussed in this answer.) More importantly, this answer uses the word "can": any person and any organization *can* do many things but this answer is vague about what the government is *willing* to do. If this question were asked after lectures on supply and demand or market equilibrium, it would also be important to be careful about *how* the price is lowered since the economist's use of constrained optimization should teach you that adding a constraint (i.e. government policy) often has unintended consequences. So, rather than simplifying the question, providing a complete, cohesive and connected answer to this changed question requires the use of even more ideas from class.

The disadvantage of providing this list of answers, which is similar to the disadvantage created by watching poker on TV where the hidden cards are revealed, is that it you may think that C answer can be changed into a B answer by adding a couple of carefully-chosen words. Two comments are worth making. First, when there is more than one possible question, it is harder to know which words should be added. For example, while this appendix analyses a question based on the Law of Demand, many students confuse the Law of Demand with the Law of Supply and Demand. This list of weak answers is designed to show you *why* the bits that are missing from C, D and F answers are relevant and important to the question as asked. Second, if

a couple of words can make so much difference, why don't students add them more often?

There is a small danger that some students may quote from these notes when asking for a higher grade because they used this or that word. Instead of using this discussion *after* the test, I would prefer if you read these notes *before* the test so that you know the difference between an A, B, C, D, or F answer and would avoid giving a weak answer.[53] The commentary identifies certain weaknesses that appear in many answers. Good answers are not only better but more reliable. It is like handicapping in golf: players with a lower handicap take fewer strokes but they also display less variability in their scores from day to day or from golf course to golf course.

A Comment on Starting to Look for an Answer

It is hard to give general advice on how to start looking for an answer if the answer is not immediately obvious. Different students face different problems when preparing for a test or working on an assignment. Discussions with previous students have helped me to clarify my ideas in class and in these notes and, as noted above, I am willing to answer specific questions or to point you in the right direction. There is a limit to how much help I can give, plus that limit varies from case to case and between help on assignments and general study help.

A couple of general comments may help since they are related to the discussion above. Some students are completely confused about how to start an answer to a question. They say they have attended every class and have taken good notes but remain confused. As a broad generalization, my discussions suggest that that the source of problems for such students is too much focus on memorization or definitions. The way to fix this problem is to see how those definitions add information to the question that is asked. (See Bad Style B.) The added information may help you to see which connections need to be used.

Some students have a "gut feel" about which answer is correct but are fuzzy or uncertain about why it is right. As noted above, having a gut feel helps you to make decision in business quickly if you do not have time to fully think through a problem but many experts have a gut feel because their experience gave them opportunities to think through similar problems in the past. Gut feel is also known to be an unreliable source of intuition. I find that such students can benefit by using more definitions because many definitions indicate important distinctions. Recognizing those distinctions could remove the fuzziness.

The lesson that I hope readers will take away from this long list of answers is that there are many ways to answer a question. Some answers are weaker than other answers. Since these weaknesses are explored directly or indirectly in a course and since better alternatives were discussed, there should be few surprises concerning which analytical tools would be most useful.

Other students have a partial answer but are uncomfortable since they know that something is missing. Or, they know their answer is wrong but cannot identify which step in the

[53] If you read this discussion before writing a take-home assignment and quote the A answer without properly citing it, then you are guilty of plagiarism. If you do so, then you have not learned one of the fundamental "take-away" lessons of these notes: that asking for an explanation in a classroom is intended to prepare you for your next challenge in the next class or in the real world.

argument has the error. For such students, I will listen as they explain their answer informally. And, sometimes, when asked to clarify their argument, they will recognize the missing bit. Or, at some critical point, I will ask "Are you sure?" which is one of the ways that I suggest that a student is using a generalization (something which is true in general, or on average, but needs to be clarified to ensure that it is true in the case being discussed). This prompts more discussion and usually the light bulb will go on to reveal what they intuitively sensed was missing. Most of the time, the instincts are right but one of the reasons that they tend to be right is because I am asking questions that are easy enough to be marked. As noted above, once you leave university, the questions become harder and the audience expects more detailed answers. Reinforcing good instincts and correcting bad instincts are two of the reasons why I ask for explanations.

Knowing what information to provide is critical especially if you want to do more than answer questions on a test. For example, if your ultimate goal is to do research on quantity demanded then understanding the effects of price changes is important. But, outside of a classroom, it is also important to be able to ask and answer a more complete set of questions: what is the effect of a change in perceptions? (what list of things might change perceptions?) what is the effect of an increase in consumer income? what is the effect of a decrease in future consumer income? has the market supply curve shifted? and many other questions. Unless you already know which one question will provide *the* answer to your research, any of these questions is potentially relevant. Thus, it is more likely that your future research will need to combine the answers to all of these questions into a single cohesive picture of how consumers behave.

Are the answers to this question subjective in the sense that any answer might be right? In a vague sense which focuses on conclusions, Yes; different situations may lead to different answers. In any one situation, only a limited number of answers can be considered as best and many more answers should be considered as weaker. In a more precise sense, which focuses on the reasonableness of the reasons used to justify any conclusion at a particular place and time, No; it is not true that any answer might be right. Business students are taught the importance of doing a situation analysis before deciding on a business strategy and they are taught the value of setting out planning assumptions.[54] Answering this question invokes the same skills. Answers which excel identify more of the critical bits and combine them in more interesting or useful ways. If you cannot provide an answer which identifies which bits of information are critical and if you cannot show why they are critical then, under most conditions, your conclusion will not be one of the best.

[54] This appendix focuses on answers that would satisfy an economics instructor and, while many students think that the study of economics is not deeply connected to the practice of business, it may be important to reinforce the idea that these answers are weak for reasons that any instructor of a business course would recognize.
For example, according to business students and after removing some fancy terminology, one particular strategy solves almost any business problem: increase price, increase advertising spending, and differentiate the brand from its competitors. To a business instructor, this generic answer *fails* to attempt to create satisfied consumers (because there is no understanding, from the *consumer's perspective*, of consumer tastes and situation). The generic answer also *fails* to identify or use a competitive advantage and *fails* to show how value is being created. *Failing* to discuss these issues, which are commonly discussed in a situation analysis, almost guarantees the *failure* of the business plan if implemented. The same logic shows why failing to give a good explanation is likely to lead to poor performance in a classroom.