

Chapter 8: How Do I Do My Best on a Test?

Test Taking Strategies

The purpose of this section of the study guide is to maximize your score on the assessment using specific strategies for multiple-choice and constructed response questions. These are the types of questions that typically appear on a midterm or final and thus are highlighted in this section.

Assessments are used to measure the amount of material you have mastered at designated points throughout a semester. They can take a number of forms such as quizzes, chapter exams, midterms, and finals. The purpose of the assessment is to provide feedback to both you and the professor. If you receive a high score, it indicates that you have done well in learning the topic assessed. If your score is not as high as you like, it let's you know that additional time is needed in studying the topic(s) before the next exam.

Mathematics is one discipline that is cumulative in nature. You need to address any misconceptions and misunderstandings in the basic concepts to progress to the next level of understanding. A strong foundation in the basics of mathematical operations and algebraic concepts will serve as the stepping-stone to higher-level courses such as calculus.

It is assumed that you already have some knowledge of the format of the exam. It is not unreasonable to ask the professor the type of questions that will be on the assessment. This is an important piece of information because it guides the manner in which you will prepare for the exam.

You should also know the approximate number of questions. This will allow you to have a plan in place as to the amount of time you will spend on each question and/or section.

The policies related to the testing situation such as time constraints, use of scrap paper, formula sheets, and calculators should also be known before the exam so assessment time will not be used to gather this fundamental information.

Come Prepared

On the day of the exam, come prepared with the materials you need for the assessment. You should have a minimum of two pencils, eraser, ruler, and highlighters. If a calculator can be used, you should have it available and in working order (change the batteries with fresh ones if you know it has been a long while since last you did this). You should wear a watch if a clock is not readily assessable in the classroom. You cell phone, PDA, Blackberry, beeper, or any electronic device that makes noise should be off during the exam. *You cannot rely on the use of your cell phone as a timing device or calculator since college policy prohibits their use.*

Distribution of the exam

While the exam is being distributed, use the time to collect your thoughts and take a deep breath. You have prepared and this is the opportunity to find out how well you know the material. The goal now is to maximize your score.

Some students may experience some level of test anxiety ranging from mild to severe. This condition is not uncommon. The research indicates a number of causes as to why students experience test anxiety such as loss of control or previous educational or testing experiences.

For those students who recognize test anxiety is a problem and it interferes with the ability to perform well on assessments, you may want to seek the aid of the Tutoring and/or Counseling Center to find out if seminars are offered on this topic. You may also find it helpful to go online or seek resources at the library that are readily available to help you.

The Assessment Before YOU

- Be certain to listen to any last minute instructions from the professor.

Although it is tempting to start the exam immediately, you may miss valuable information. At this time, the professor may be making corrections to the exam or reminding you of last minute details that can prove to be very beneficial.

- Write your name on the exam.

- Create a reference sheet to be used during the exam.

This is particularly important if you know you have had trouble in the past recalling facts during the administration of a test due to test anxiety.

Turn the exam over or use scrap paper (if allowed) and spend the first minute or so writing down any formulas or information that you have memorized for the exam.

This information will serve as a reference sheet for use later on during the exam. In MATH 082, you will want to list any formulas that you studied for the exam, such as the slope formula. You may also note any patterns such as the patterns for difference of perfect squares or perfect square trinomials. You may find it helpful to list perfect squares for a reference.

- Preview the test quickly.

Skim over the questions to familiarize yourself with the exact layout of the exam. The investment in time for previewing the exam is time well spent because after skimming the test there are no unknowns about the length or format of the exam.

- Finalize your reference sheet.

Write any other useful information that you now recall after the test preview to aid you during the exam. This information should be continued on your 'reference sheet' that you already started at the beginning of the exam.

Completing the Exam...Does order matter?

Many resources encourage students to answer the questions by degree of difficulty – completing the easiest questions first and the most difficult last. There will be questions that you know immediately after reading the question. There may be other questions that will require more thought and work before arriving at the solution. By attacking the easiest questions first you will be better able to pace yourself. Also, if all questions are worth the same point value, you can maximize your score by answering the easiest questions first.

If you know ahead of time that the brief constructed response questions are most challenging, you may want to attack these questions after the multiple-choice questions. That is a decision that you need to make based on your degree of comfort with the material. You can view the test as consisting of two parts – multiple-choice and free response or you may prefer to view the exam as one cohesive unit. If all questions are worth the same amount of points, it may be to your advantage to view the exam as one unit as opposed to two distinct sections. In this view, you would answer the easiest of all questions first.

This section is divided into two types of questions you will encounter on a typical midterm or final exam for a course: multiple-choice and constructed or free response questions.

Multiple-Choice Questions

This type of question commonly occurs on assessments and includes a stem (the question itself) and choices. There commonly are four to five possible answers for each question. Although this type of question may seem easy on the surface since the answer is already in a line-up, multiple-choice questions can be very tricky. Having a strategy to answer multiple-choice questions can greatly improve the probability of answering the question correctly.

General Strategy

- Read the entire question carefully including the choices.
- Reread the stem of the question and focus on what the question is asking.

Although this may seem apparent, the interpretation of the question can drastically change with the use of a single word such as 'not' or 'best'.

- Highlight, underline, or circle any word or words or values given in the stem of the question that are needed to answer the question.

There may be extra information given in the question. This information need not be considered when answering the question so you don't need to circle it.

- Consider the choices and eliminate the ones that upon inspection are not the correct answer.

Using what you know, eliminate the choices that are definitely not the answer. This is similar to the last step in problem solving which is the 'look back' step to determine if the answer makes

sense. You can use this as a beginning strategy in a multiple-choice question. This strategy improves the probability of correctly answering the question without spending much time. This technique will be illustrated shortly.

- Determine the correct answer from the choices that remain.

Now is the time to apply a math strategy to answer the question. Use scrap paper (if allowed) or write on the test to determine the answer. You may want to use the calculator after completing the work without its aid for a check.

You should not rely on doing everything in your head since this makes it difficult to check your work. It is also very easy to make careless mistakes.

If the question requires calculations, be certain to rewrite the numbers correctly in your workspace. It is not uncommon to transpose numbers that will ultimately lead to an incorrect answer so, be careful.

- Check to ensure that you have correctly marked the answer.

If you are using a scantron check for correspondence between the number of the question and the scantron row bubbled – they must match.

Applying the Strategies for Multiple-Choice Questions

Question 1: Add. $(-8) + (-2)$

- (a) -6 (b) 10
(c) 16 (d) -10

The question is first read in its entirety including the choices.

The words and values are highlighted so as to focus on what operation is needed and what numbers will be used.

The choices are now considered for possible elimination. Two negative numbers are to be combined (added). The sum of the two integers with like signs must therefore have the sign of the original integers. The sum therefore will be negative. Choices (b) and (c) are eliminated. (Visually you may want to cross these answers out to avoid distraction as shown below.)

Question 1: Add. $(-8) + (-2)$

- (a) -6 ~~(b)~~ 10
~~(c)~~ 16 (d) -10

The only answers now being considered are (a) and (d)

The work now has to be completed. To add the two negative integers, combine their absolute values and attach the original sign of the integers. The work is now complete and the correct answer is $(d) -10$. This result can be verified by using the calculator.

Note: You may have eliminated the (a) choice based on your knowledge of negative integers. If you combine two negative numbers, the sum cannot be less negative, closer to zero than one of addends. Choice (a) could have eliminated as well, leaving (d) as the only possible answer.

Applying the Strategies for Multiple-Choice Questions

Question 2. Factor. $x^2 - 36$

[A] $(x+6)(x-8)$

[B] $(x-6)(x-6)$

[C] $(x+6)(x+6)$

[D] $(x+6)(x-6)$

The question is first read in its entirety including the choices.

The key word is highlighted to focus on what the question is asking.

By quickly observing the choices, you already know that when factored, the answer will consist of the product of two binomials.

There are several ways to attack this problem. Let's apply what we know about multiplying two binomials – in other words FOIL. When you multiply the 'L' (the product of the last or second terms in both binomials) you must get a product -36 . This eliminates (a) since the product is $(6) \times (-8)$ which is (-48) , (b) since the product is $(-6) \times (-6) = 36$, and (c) since the product is $(6) \times (6)$ which again is 36 .

Question 2. Factor. $x^2 - 36$

~~[A] $(x+6)(x-8)$~~

~~[B] $(x-6)(x-6)$~~

~~[C] $(x+6)(x+6)$~~

[D] $(x+6)(x-6)$

The only answer remaining is (d). Checking the 'L' yields a product of $(6) \times (-6)$, which is -36

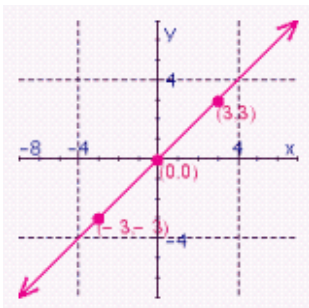
Alternate Option: Referring to your reference sheet, you may have listed the pattern for perfect squares. x^2 and 36 are perfect squares. You are factoring the difference of perfect squares. The pattern is $(a-b)(a+b) = a^2 - b^2$. The 'a' must be equivalent to x and the 'b' is 6 . Thus the answer is $(x + 6)(x - 6)$



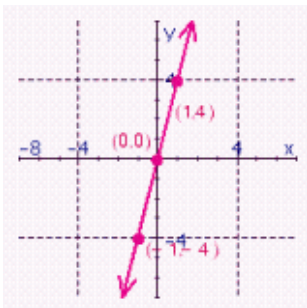
A major topic in MATH 082 is graphing of linear functions. Let's consider a graphing function.

Question 3 Graph the line. $y = \frac{1}{3}x$

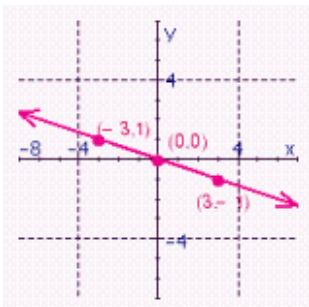
a.



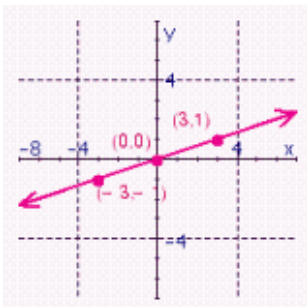
d.



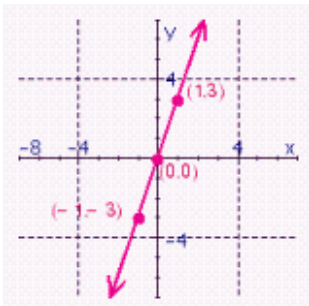
X



e.



c.



The question is first read in its entirety including the choices. There are five choices for this question but the strategy for answering the question remains the same.

The key word is highlighted so as to focus on what the question is asking. Using what you know about the equation of a line, you recognize the format of the given linear function as slope intercept. The generic form is most likely on your reference sheet that you produced at the beginning of the test.

Since this format is $y = mx + b$ and the equation given is $y = 1/3x$. Circle the value of the slope and note the value of the y-intercept. The slope is circled in blue in the question, it is a positive $1/3$, and since no value appears after the mx term the y-intercept is zero.



By quickly observing the choices, you already know that you can eliminate any line that has a negative slope. Choice (b) is eliminated. All choices have a y-intercept of 0 so this piece of information does not eliminate any of the choices but you should consider it when presented with a graphing question – it could help.

Now, a strategy must be employed to identify the correct answer. The slope of the line is the change in y over the change in x, or rise over run. If you place your pencil at the value of the y-intercept, the origin, and move vertically up one unit and horizontally to the right 3 units, the new point must lie on the line. The coordinates of the second point are (3, 1).

Looking at the graphs, the correct answer is (e). The coordinates of the point indicated are (3, 1).

Alternate Method: You could plug in one value noted on the graphs for (a), (c), (d) and (e) and check to determine if the statement would be true if the values for x and y were substituted into the original equation.

Example: The given equation is $y = \frac{1}{3}x$. Substituting the point (3, 3) into the equation indicated for choice (a) yields the statement $3 = 1/3(3)$ or $3 = 1$. This is not true and thus choice (a) is eliminated as the possible answer.

This process of substitution would continue for the other choices. Again, the only true statements would occur for choice (e).

Let's check this choice using the point (-3, -1) that appears on the graph. The value (-3) will be substituted for the 'x' and (-1) will be substituted for the 'y'.

Thus, the statement to check is $(-1) = 1/3(-3)$ or $(-1) = (-1)$. Of course any number is equal to itself and the correct selection (e) is verified.

You could have used the other point (3, 1) and arrive at a true statement $1 = 1$.

Free-Response

This type of question requires you to construct the answer without aid of choices that may aid in the solution; they are commonly referred to as constructed responses. An elimination strategy cannot be employed. The questions are not necessarily more difficult than the multiple-choice although many students may perceive them as more difficult.

General Strategies

- Read the entire question carefully.
- Reread the question and focus on what the question is asking.
- Highlight, underline, or circle any word or words or values given in the question that are needed to answer the question.

There may be extra information given in the question. This information need not be considered when answering the question so you don't need to circle it.

- Take a minute to think about the strategy you will apply – in other words, decide on your plan.

Do not start working on the question until you know the path you will follow. You may find it useful to refer to your reference sheet if you are having difficulty deciding on what to do. You can also look back at the multiple-choice questions that are on similar topics - this may also help you determine a course of action.

If you are still having trouble starting the question, you may want to consider just skipping it for now and completing any other questions that remain. You can revisit the question at the end of the test if time allows.

- Apply your strategy.

Present work in a neat and logical manner. The person who is grading the exam will be able to follow your work if you present it in an orderly fashion.

If you are applying any formulas, write the formula on your exam. Do not begin substituting values until the formula is noted. There is a high probability that partial credit will be available for substantial work towards the solution so, it is worth your effort to make your work easy to follow.

Any work that you do not want graded should be crossed out with a single line.

Parallel solutions, presenting two solutions with different answers, will most likely cause a loss of all credit. Present the answer you believe is correct. Do not present an either or solution.

- Check your work if time allows.

Ask yourself if the solution answers the question and does the answer make sense.

- Indicate your final answer by circling or underlining it.

Applying the Strategy for Free Response Questions

Question 1: Evaluate: $24 - (-2)^3 + 4 \times 3$

Read the question to determine what it is asking.

Determine a strategy to answer the question.

This question will require the order of operations to evaluate the numeric expression.

Refer to your reference sheet. You most likely have PEMDAS noted on the sheet

Take a minute to plan your layout of the solution. You will do one operation at a time following the order of operations.

Begin the process being careful to show all work in a neat and orderly fashion such as the presentation below:

PEMDAS

$$24 - \underline{(-2)^3} + 4 \times 3$$

$$24 - (-8) + \underline{4 \times 3}$$

$$24 - (-8) + 12$$

$$\underline{24} + 8 + 12$$

$$32 + \underline{12}$$

$$\textcircled{44}$$

● **Note:** The order of operations is noted on the first line using the acronym PEMDAS.

● The original expression is rewritten. Care is taken to assure the problem was copied exactly as indicated in the question.

● One operation is done at a time indicated by the underlined portion of the expression to indicate what has done to proceed from one step to the next.

● The final answer is circled.



Applying the Strategy for Free Response Questions

Question 2: Factor $6x^6 + 2x^5$

Read the question carefully to determine what it is asking.

The question asks for the binomial to be factored. This direction implies that the factoring must be done completely even though it does not explicitly state it.

Determine a strategy to answer the question.

One strategy may be to circle the two terms that comprise the binomial as indicated.

Rewrite the two terms to determine the greatest common factor between the coefficients and then the powers of x .

$$6x^6 \quad 2x^5$$

The greatest common factor between 6 and 2 is 2. The greatest factor between an x^6 and x^5 is the lowest power of the exponent of x , which is 5.

The greatest factor between the terms is $2x^5$.

The last thing to do is to complete the factoring as below:

Answer: $2x^5(3x + 1)$

A visual check of the terms within the parenthesis should be done to assure you have factored the binomial completely. The greatest common factor between $3x$ and 1 is 1 so, the factoring was done completely.

Since a check on this question involves a small commitment in time, it should be done at this point. The product of the monomial ($2x^5$) and binomial ($3x + 1$) must result in the original binomial in the question if done correctly.

$$2x^5(3x + 1) = 2x^5(3x) + 2x^5(1) = 6x^6 + 2x^5 \quad \text{It does check.....Move onto the next question....}$$



Applying the Strategy for Free Response Questions

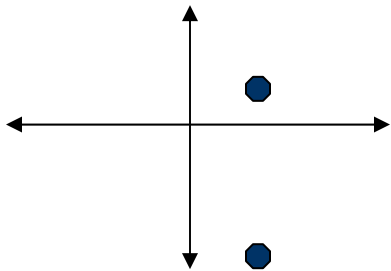
Question 3: Find the slope of the line that passes through the points (4, 1) and (4, -8)

Read the question carefully to determine what it is asking.

Determine a strategy to answer the question.

It is worth the time to again look at what points were given. In this question you will note the x value of both points is the same, it is a 4. The only line that has the x coordinate for both points as a 4 is the line $x = 4$.

Visualize learners will find this question easier to answer by producing a quick sketch of a plane and plotting the given points.



The line that would pass through these two points would be vertical. Using your knowledge of lines, you will recognize this as the line with the equation $x = 4$.

A vertical line has a slope that is undefined. The final answer is the slope that passes through the given points has a slope that is undefined.

Answer: Slope is undefined.

Alternate method on the next page.

Alternate method: The formula to determine the slope of a line given two points is most likely on your reference sheet. You may want to calculate the slope by employing the formula and then showing all work as below:

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

Given points: (4 , 1) and (4, -8)

Points (x_1, y_1) (x_2, y_2)

$\text{slope} = \frac{1 - (-8)}{4 - 4} = \frac{9}{0} = \text{undefined}$ *slope* Note: A zero in the denominator results in an undefined answer.

Answer: Slope is undefined

Closing Points for Testing Strategies

- Always attempt every question on an assessment even if unsure of the answer.
- Never leave a multiple-choice question blank.

Keep in mind that you still have a chance of getting a multiple-choice question correct by randomly selecting a response.

- Free response questions commonly involve the use of a formula, property, or law. Write something in the space provided for the free-response.

Even if credit is not awarded you will have a record of your thoughts when reading the question. This can prove valuable for a follow-up assessment.

- With every assessment, keep in mind that it is part of the learning process. The feedback you receive on the graded exam will help you prepare for future assessments.



