

## Study Guide for Midterm Three

The midterm is 120 minutes long and will be given on Thursday, November 19 at 2:00 and 4:30 pm. **The test will be given in Building 3, Room 142.** Please arrive early to get checked in so that you get the entire two hours to work on the test. The test will cover chapter 6 through section 8.2. To study for this test, go through your homework, quizzes, and StudyPlan. The test is closed book and closed notes. You will need your calculator for the test. You may not share calculators or use mine. Please seek help in the Math Lab early and frequently.

Be familiar with the instructions specified in the homework and study guide. The wording on the test will be similar. It is important to not just know how to do a problem, but to understand what exactly the problem is asking you to do. **Some problems with multiple parts will span several sections and chapters.** Some examples are included in this study guide.

**You must bring a photo ID and a calculator to the exam.  
Students without a photo ID will not be allowed to take the exam.**

**Make sure you sign up online to take the test by Monday, November 16 at 11:00 pm.  
Students who do not sign up will not be guaranteed a seat or test.**

**Any use of other electronic devices such as cell phones and mp3 players will result in a 0 on the exam.**

Below are some problems and instructions that are representative of the types you will see on the test. See your textbook and homework for additional problems.

**1. Factor. If the polynomial is prime, say so. Show all work for full credit. Circle your final answers.**

a) $x^2 - 11x + 18$	b) $2x^2 + 20x + 42$
c) $25x^2 - 16$	d) $x^2 - 4xy - 21y^2$
e) $5x^5 + 45x^4 + 70x^3$	f) $3xy^2 - 48x$
g) $-x^2 - 4x - 3$	h) $3x^3 + x^2 + 27x + 9$

**2. Perform the indicated operations & simplify your answers. Circle your final answers.**

a) $(4p + 8q) + (4p - 9q)$	b) $(3t - 5w)^2$
c) $(2x - 5)(3x^2 + 4x - 2)$	d) $-5xy(3x^2 - 7xy + 9y^2)$
e) $2(x + 3)^2 - 4$	f) $5p^3t(-6p^3t)$
g) $(11x - 7) - (5x + 8)$	h) $(5x - 4y)(3x - 6y)$

**3. Simplify. Use integers or simplified fractions only in your answers. Circle your final answers.**

a) $\frac{48x^6y^4}{8x^5y^{-3}}$	b) $\frac{4^{-8}}{4^{-6}}$	c) $(4x^{-2}y)^3$
d) $-5c^4(c^2)^5$	e) $7^{-2}$	f) $\frac{(2a^{-6}b)^{-3}}{(3cd^{-2})^2}$

**4. Solve the system by substitution.**

$$\begin{aligned} 6x - 5y &= -8 \\ x + 3y &= 14 \end{aligned}$$

- a) Circle the correct description of the system.
- i. Dependent system
  - ii. One solution system
  - iii. Inconsistent system.
- b) What is the solution of the system of the system of equations? Circle the correct choice below, and if necessary, fill in the answer box to complete your choice.
- i. \_\_\_\_\_ (Write the ordered pair.)
  - ii. There are infinitely many solutions.
  - iii. There is no solution.

**5. Solve the system by elimination.**

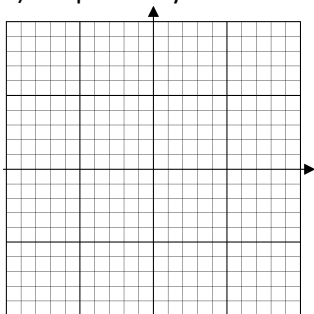
$$\begin{aligned} 6x - 9y &= -3 \\ -10x + 15y &= 4 \end{aligned}$$

- a) Circle the correct description of the system.
- i. Dependent system
  - ii. One solution system
  - iii. Inconsistent system.
- b) What is the solution of the system of the system of equations? Circle the correct choice below, and if necessary, fill in the answer box to complete your choice.
- i. \_\_\_\_\_ (Write the ordered pair.)
  - ii. There are infinitely many solutions.
  - iii. There is no solution.

**6. Find the solution of the system by graphing the equations by hand.**

$$\begin{cases} x - 3y = -6 \\ 4x - 3y = 12 \end{cases}$$

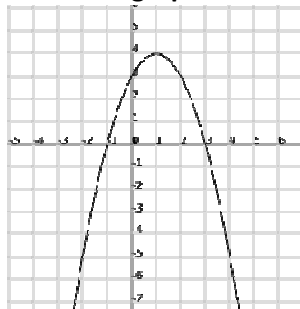
a) Graph the system.



b) Circle the correct description of the system.

- i. Dependent system
  - ii. One solution system
  - iii. Inconsistent system.
- c) What is the solution of the system of the system of equations? Circle the correct choice below, and if necessary, fill in the answer box to complete your choice.
- i. \_\_\_\_\_ (Write the ordered pair.)
  - ii. There are infinitely many solutions.
  - iii. There is no solution.

**7. Use the graph below to answer the questions that follow.**



- a) Find  $f(3)$ .
- b) Find  $x$  when  $y = -4$ .
- c) Find the  $y$ -intercept(s).
- d) Find the  $x$ -intercept(s).
- e) Find the vertex.

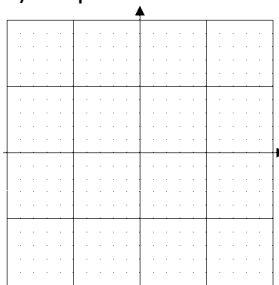
8. Graph the equation by hand. To begin, substitute the values of -3, -2, -1, 0, 1, 2, and 3 for  $x$ . Make other substitutions as necessary. Then use a graphing calculator to verify your work.

$$y = -2x^2 + 4x - 2$$

a) Complete the table below

$x$	$y$
-3	
-2	
-1	
0	
1	
2	
3	

b) Graph



9. Ad-supported cable television has gained ground steadily on broadcast television (see the table). Use this data to answer parts (a) – (c).

	Prime-Time Household Viewing Shares (percent)							
Year	1988	1990	1992	1994	1996	1998	2000	2003
Broadcast	80.2	76.1	73.8	72.2	66.7	59.4	56.1	48.1
Ad-supported cable	10.6	14.9	17.8	19.7	25.0	31.0	34.0	41.4

a) Let  $s$  be the prime-time household viewing share for all broadcast TV stations at  $t$  years since 1980. Find an equation of a model to describe the data. Circle the correct answer below.

- i.  $s = 4.18t + 98.99$       ii.  $s = -4.18t + 98.99$       iii.  $s = 2.14t + 98.99$       iv.  $s = -2.18t + 98.99$

b) Let  $s$  be the prime-time household viewing share for all ad-supported cable TV stations at  $t$  years since 1980. Find an equation of a model to describe the data. Circle the correct answer below.

- i.  $s = 2.04t - 6.56$       ii.  $s = -2.04t - 6.56$       iii.  $s = 4.18 - 6.56$       iv.  $s = -4.18 - 6.56$

c) Use substitution or elimination to estimate when the prime-time household viewing shares for all broadcast stations and all ad-supported cable stations were equal. What is that viewing share? Use the answers from parts (a) and (b) to find these answers.

Remember to show all work and answer the questions in a complete sentence for full credit.  
**Round your intermediate answers to two decimal places and final answers to the nearest year or two decimal places, as appropriate.**

There will be an extra credit quiz posted in MyMathLab that is **due at 11:00 pm on Wednesday, November 18.** These are additional problems similar to the ones above. The extra credit is worth up to 10 points on your midterm. The number of points will be determined by the tens digit (or tens and hundreds digit in the case of 100%) of your quiz score. You will get three attempts as usual. Try to do it without help the first time to see if you really understand the material.

Examples of extra credit points:  
 9 points for a score of 98.2%, 5 points for a score of 52.8%, 10 points for a score of 100%