

Study Guide for Midterm

The midterm is 120 minutes long and will be given on Monday and Tuesday, July 13 and 14 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 Thursday, July 9 at 11:00 pm.
 Students who do not sign up will not be guaranteed a seat or test. Signups will begin on Monday, July 6.

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. Solve the system by substitution. If the system is inconsistent or dependent, say so. Verify your solution by checking that it satisfies both equations in the system (if applicable).

$$6x - 5y = -8$$

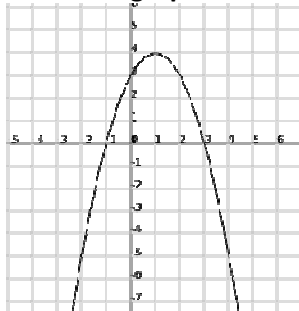
$$x + 3y = 14$$

3. Solve the system by elimination. If the system is inconsistent or dependent, say so. Verify your solution by checking that it satisfies both equations in the system (if applicable).

$$6x - 9y = -3$$

$$-10x + 15y = 4$$

4. 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.

5. The numbers of men and women who earned a bachelor’s degree are listed in the table below for various years. Let n be the number of people (in thousands) who earned a bachelor’s degree in the year that is t years since 1980.

Year	Number of People Who Earned a Bachelor’s Degree (thousands)	
	Women	Men
1980	456	474
1985	497	483
1990	560	492
1995	634	526
2000	708	530
2002	742	550

Reasonable models for the women and men are

$n = 13.28t + 440.09$	Women
$n = 3.42t + 468.14$	Men

Use substitution or elimination to estimate when the number of women who earned a bachelor’s degree was equal to the number of men who earned a bachelor’s degree. What was the number of people?

Remember to show all work and answer the question in a complete sentence for full credit.
Round your intermediate answers to two decimal places and final answers to the nearest counting numbers.

- 6. You invested \$7000 in two accounts paying 7% and 9% annual interest, respectively. If the total interest earned for the year was \$550, how much was invested at each rate? You do NOT need to solve the problem.
 - a) Define each variable.
 - b) Write a system of two equations.

- 7. A 10,000 seat amphitheater will sell tickets at \$22 and \$30 for a Sarah McLachlan concert. How many tickets should be sold at each price for a sellout performance to generate a total revenue of \$232,000? You do NOT need to solve the problem.
 - a) Define each variable.
 - b) Write a system of two equations.

8. 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) $(5x - 4y)(3x - 6y)$

9. 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) $\frac{(2a^{-6}b)^{-3}}{(3cd^{-2})^2}$

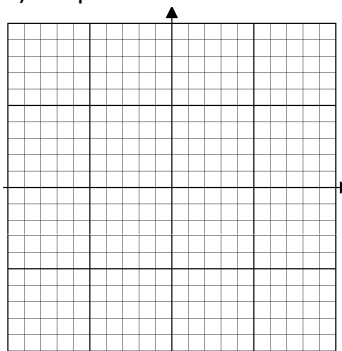
10. Graph the equation by hand. To begin, substitute the values of -3, -2, -1, 0, 1, 2, and 3 for x . Make other substitutions as necessary. Then use a graphing calculator to verify your work.

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

a) Complete the table below

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

b) Graph



There will be an extra credit quiz posted in MyMathLab that is due at 11:00 pm on Sunday, July 12. 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%