

## 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 all of chapters 1 through 5. 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.**

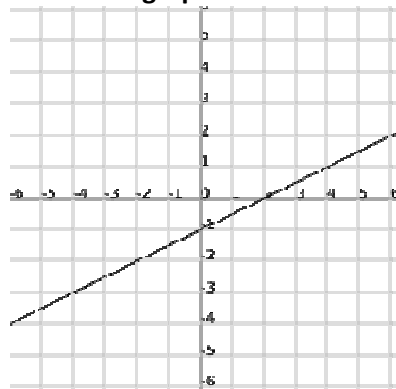
**Make sure you sign up online to take the test by Thursday, July 9 at 11:00 pm.** Students who do not sign up will not be guaranteed a seat or test. Signups will begin on Monday, July 6.

**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. Let  $c$  be the total cost (in dollars) of  $n$  tickets to a Cold Play concert. What is the dependent variable?**

**2. Use the graph to answer the questions.**



- a) Find  $f(-4)$
- b) Find  $x$  when  $y = 1$ .
- c) What is the  $y$ -intercept of the line? Write your answer as an ordered pair.
- d) What is the  $x$ -intercept of the line? Write your answer as an ordered pair.

**3. Evaluate the following expressions for  $a = 2$ ,  $b = -5$ ,  $c = -4$ , and  $d = 10$ . Show all work for credit.**

a) $\frac{a}{d} \div \frac{b}{c}$	b) $b^2 - 4ac$	c) $\frac{-b-c^2}{2a}$	d) $2c^2 - 5c + 3$
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**4. Simplify the expression or solve the equation, as appropriate.**

Unless otherwise specified, use integers or simplified fractions only in your answers.

a) $-8 = \frac{4x}{7}$	b) $5(x - 2) - (3x + 6) = 6(5x + 3)$	c) $-5.5 + 4.6(3.5x - 9.1)$ Round your answer to the nearest tenth.
d) $\frac{5}{6} + 2x + 5 - \frac{7}{9}x$	e) $\frac{2}{9}(15x + 6)$	f) $\frac{7x}{8} + \frac{1}{2} - \frac{3x}{4} = 0$

**5. Solve the inequality. Describe the solution set as in inequality, in interval notation, and in a graph.**

a) $5(x - 2) \geq 15$	b) $\frac{3}{4}t - \frac{1}{2} \leq \frac{1}{4}$	c) $\frac{2b-4}{3} < \frac{3b-4}{4}$
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**6. Determine whether the pair of lines is parallel, perpendicular, or neither.**

$$y = \frac{6}{7}x + 10 \quad \text{and} \quad y = -\frac{7}{6}x - 10$$

**7. Perform the indicated operations and simplify your answers. *Show all work for credit!***

Unless otherwise specified, your answers should be an integer or simplified fraction.

a) $\frac{4}{15} + \frac{5}{9}$	b) $5[3 + 2(4 - 2)]$	c) $9(4 - 6)^2 - 2(2 - 4)^3$
d) $(-5)^2$	e) $\left(\frac{3}{5}\right)^2$	f) $\frac{-15(-8)}{10 - (-10)}$

**8. Use your calculator to perform the indicated operations. Round the result to two decimal places.**

$$18.67 - 36.9(22.4) + 12.38 \div 5.72$$

**9. For the following problems, let  $x$  be a number.**

- a) Subtract 14 from the quotient of the number and  $-2$ .
- Translate the English phrase into a mathematical expression.
  - Evaluate the expression for  $x = -14$ . Show all work for full credit.
- b) Two times the difference of a number and 5 is  $-6$ .
- Translate the English phrase into a mathematical equation.
  - Solve the equation.

**10. Plot the ordered pairs below in a coordinate system.**
 $(-4, 2), (5, 0), (0, -3), (-3, -6)$ 
**11. Use the slope formula to find the slope of the line that passes through the two given points.****(6, 7) and (8, 1)**

- a) Slope (Write your answer as an integer or simplified fraction): \_\_\_\_\_
- b) Is the line increasing, decreasing, horizontal, or vertical?

**12. A country's oil exports decreased approximately linearly from 1070 million barrels in 1996 to 530 million barrels in 2000. Find the average rate of change of the country's oil exports per year. Write your answer in a complete sentence in the context of the problem.**

**13. Let  $n$  be the average number of cars sold per week by a car dealership at  $t$  years since 1990. What does the ordered pair (15, 25) represent? Write your answer in a complete sentence.**

14. A set of points is described in the table below. Find an equation of the line that contains the points.

$x$	$y$
0	5
1	7
2	9
3	11
4	13

Equation: \_\_\_\_\_

15. Find an equation of the line containing the given pair of points. Write your answer in slope-intercept form. Use integers or simplified fractions for any numbers in your answer.

$$(-2, -3) \text{ and } (-8, -7)$$

16. The percentage of mothers who smoke cigarettes during pregnancy has declined approximately linearly from 13.9% in 1995 to 12.0% in 2000. Let  $t$  be the number of years since 1995 and  $p$  be the percentage of mothers who smoke cigarettes during pregnancy.

- Which variable is the independent variable?
- What is the slope? What does it mean in this situation?
- What is the  $p$ -intercept as an ordered pair? What does it mean in this situation?
- Find the equation of a linear model to describe the data.
- What is the  $t$ -intercept as an ordered pair? What does it mean in this situation?
- Predict the percentage of mothers who smoke cigarettes during pregnancy in 2010. Show all work and write your answer in a complete sentence.
- When did the percentage of mothers who smoked cigarettes during pregnancy reach 5%? Show all work and write your answer in a complete sentence. Round your answer to the nearest year.

17. Consider the numbers below. Which of these numbers are the given type of number?

$$\left\{ \frac{4}{5}, -3, 0.2, 0, -\pi, 5.8, \sqrt{64}, -\sqrt{5} \right\}$$

- The counting numbers are: \_\_\_\_\_
- The negative integers are: \_\_\_\_\_
- The integers are: \_\_\_\_\_
- The rational numbers are: \_\_\_\_\_
- The irrational numbers are: \_\_\_\_\_
- The real numbers are: \_\_\_\_\_

18. Use the following linear equation to answer the questions that follow.

$$5.01x - 4.66y = -11.02$$

- Write the linear equation in slope-intercept form. Round to two decimal places as needed.
- Using your model from part (a), find the  $x$ -intercept. Write it as an ordered pair.
- Using your model from part (a), find the  $y$ -intercept. Write it as an ordered pair.

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%