Study Guide for Midterm One

The midterm is 120 minutes long and will be given on Tuesday and Wednesday, September 15 and 16 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 1 through section 3.3. 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 (student ID, drivers license, passport) and a calculator to the exam.
Students without a photo ID will <u>not</u> be allowed to take the exam.

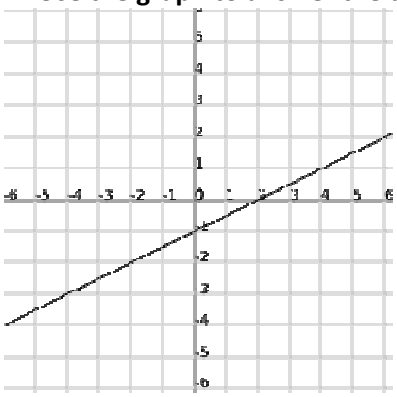
Make sure you sign up online to take the test by Friday, September 11 at 11:00 pm. Students who do not sign up will not be guaranteed a seat or test. Signups will begin on Tuesday, September 8.

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

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.

In general, ***do not use mixed numbers***. Instead, ***use improper fractions*** from here on out.

1. Use the graph to answer the questions.



a) Find x when $y = 1$.
b) Find y when $x = 2$.
c) What is the slope of the line?
d) What is the y -intercept of the line? Write your answer as an ordered pair.
e) What is the x -intercept of the line? Write your answer as an ordered pair.

2. Evaluate the following expressions for $a = 2, b = -5, c = -4$, and $d = 10$. Show all work for credit. Unless otherwise specified, write your answers as integers or simplified fractions.

a) $\frac{a}{d} \div \frac{b}{c}$	b) $b^2 - 4ac$	c) $\frac{-b-c^2}{2a}$	d) $2c^2 - 5c + 3$

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

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

4. An airplane drops from 32,500 feet to 27,800 feet. Find the change in altitude. Show all work for credit.

5. Perform the indicated operations and simplify your answers. *Show all work for credit!* No work means no credit! Unless otherwise specified, your answers should be an integers or simplified fractions.

a) $2(5)^2 - 6 \div 2 + 1$	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) $\frac{-15(-8)}{10-(-10)}$

6. For the following problems, let x be a number.

a) Subtract 14 from the quotient of the number and -2.
   i. Translate the English phrase into a mathematical expression.
   ii. Evaluate the expression for $x = -14$. Show all work for full credit.
b) 7 more than the product of -2 and the number
   i. Translate the English phrase into a mathematical expression.
   ii. Evaluate the expression for $x = -14$. Show all work for full credit.

7. Use the slope formula to find the slope of the line that passes through the two given points.
$(\mathbf{6}, \mathbf{7})$ ***and*** $(\mathbf{8}, \mathbf{1})$

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

8. The number of complaints (in thousands) of identity theft in the years 1999, 2000, 2001, and 2002 is, 148, 173, 208, and 247, respectively. Let n be the number of complaints (in thousands).

a) Use points on a number line to describe the values of n. Be sure to label the units on the number line.
b) Find the average of the values you plotted in part (a). Round your answer to the nearest integer.
c) Did the number of complaints increase, decrease, stay approximately constant, or none of these between 1999 and 2002, inclusive? Explain your reasoning.
d) Did the increases in the number of complaints per year increase, decrease, stay approximately constant, or none of these between 1999 and 2002, inclusive. Explain your reasoning.

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

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

a) The counting numbers are: _____
b) The negative integers are: _____
c) The integers are: _____
d) The rational numbers are:_____ _____
e) The irrational numbers are: _____
f) The real numbers are: _____

10. Which of the given ordered pairs satisfy the given equation? Show all work for full credit.
$y = -5x + 8$ $(-2, 3), (0, 8), (3, -7)$

11. 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.

12. Graph $y = -\frac{1}{4}x + 3$

a) y-intercept as an ordered pair:_____
b) Slope:_____
c) Graph

13. Let r be the revenue (in millions of dollars) of a company for the year that is t years since 2000. Some pairs of values of t and r are shown in the table to the right.

t (years)	r (millions of dollars)
0	7
1	10
3	16
4	19
6	25

a) Create a scattergram of the data. Then draw a linear model. **Be sure to label your axes and the units.**

b) When was the revenue \$13 million? Write your answer in a complete sentence in the context of the problem.

c) Predict the revenue in 2010. Write your answer in a complete sentence in the context of the problem.

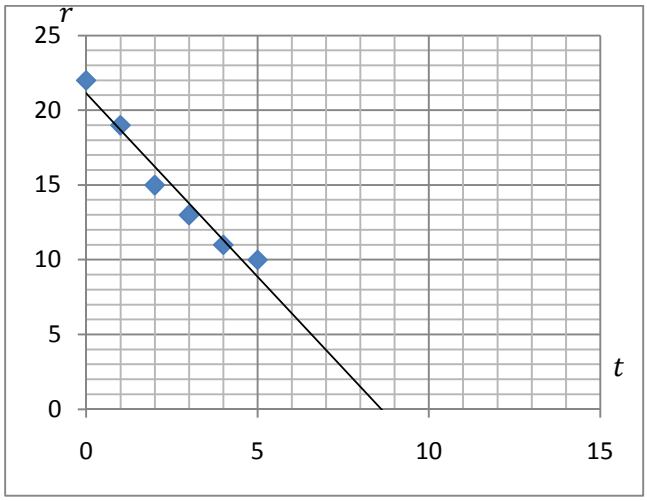
d) What is the r –intercept of the model? What does it mean in this situation? Write your answer in a complete sentence in the context of the problem.

14. Perform the indicated operations and simplify your answers. *Show all work for credit!*
Unless otherwise specified, your answers should be integer or simplified fraction.

a) $\frac{2}{11}\cdot\frac{3}{7}$	b) $\frac{2}{3}\div 6$	c) $\frac{3}{14}+\frac{5}{4}$
d) $-\frac{1}{11}-\left(-\frac{10}{11}\right)$	e) $\left(\frac{3}{5}\right)^2$	f) $\frac{3}{7}\left(-\frac{4}{5}\right)$

15. If there are too many ticketed passengers for a flight, a person can volunteer to be "bumped" onto another flight. The voluntary bumping rates for large US airlines (number of bumps per 10,000 passengers, January through September are shown in the table for various years. Let r be the voluntary bumping rate (number of bumps per 10,000 passengers) at t years since 2000. Use the scattergram and linear model to answer the questions that follow.

Year	Bumping Rate
2000	22
2001	19
2002	15
2003	13
2004	11
2005	10



a) What is the r-intercept of the model?

b) What does it mean in this situation? Write your answer in a complete sentence.

c) Predict when the voluntary bumping rate will be 6 bumps per 10,000 passengers. Round your answer to the nearest year and write your answer in a complete sentence.

d) Use your model to predict what the bumping rate will be in 2007. Round your answer to the nearest integer. Write your answer in a complete sentence.

There will be an extra credit quiz posted in MyMathLab that is due at 11:00 pm on Monday, September 14. 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%