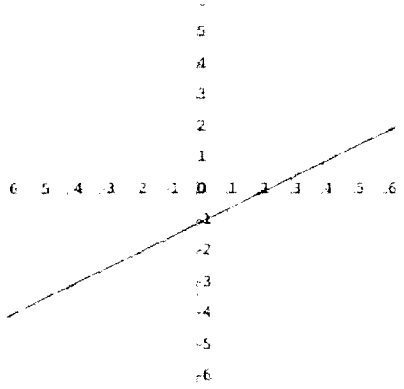
Answers to Study Guide for Midterm

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 $y = 1$. 4

b) Find y when $x = 2$. 0

c) What is the slope of the line? $\frac{1}{2}$

d) What is the y -intercept of the line? Write your answer as an ordered pair. $(0,-1)$

e) What is the x -intercept of the line? Write your answer as an ordered pair. $(2,0)$

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) $2c^2 - 5c + 3$
$\frac{4}{25}$	57	$\frac{-11}{4}$	55

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

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

805.73

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

change in quantity = ending qty − starting qty

−4700 ft

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) $9(4-6)^2 - 2(2-4)^3$
48	35	52
d) $(-5)^2$	e) $\left(\frac{3}{5}\right)^2$	f) $\frac{-15(-8)}{10-(-10)}$
25	$\frac{9}{25}$	6

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.

$\frac{x}{-2} - 14$

ii. Evaluate the expression for $x = -14$. Show all work for full credit.

-7

b) 7 more than the product of -2 and the number

i. Translate the English phrase into a mathematical expression.

$-2x+7$

ii. Evaluate the expression for $x = -14$. Show all work for full credit.

35

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

C

8. Use the slope formula to find the slope of the line that passes through the two given points.

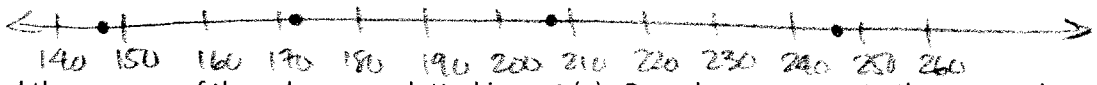
$(6, 7)$ *and* $(8, 1)$

a) Slope (Write your answer as an integer or simplified fraction): -3

b) Is the line increasing, decreasing, horizontal, or vertical? decreasing

9. 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.

194

know what that means

c) Did the number of complaints increase, decrease, stay approximately constant, or none of these between 1999 and 2002, inclusive? Explain your reasoning.

increase - notice that the numbers are increasing in the original data set

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.

increase - the distances between the points are increasing as you move from left to right on the number line

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

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

a) The counting numbers are: $\sqrt{64}$

b) The negative integers are: -3

c) The integers are: $-3, 0, \sqrt{64}$

d) The rational numbers are: $4/5, -3, 0.2, 0, 5.8, \sqrt{64}$

e) The irrational numbers are: $-\pi, -\sqrt{5}$

f) The real numbers are: $4/5, -3, 0.2, 0, -\pi, 5.8, \sqrt{64}, -\sqrt{5}$

11. Which of the given ordered pairs satisfy the given equation? Show all work for full credit

$y = -5x + 8$ $\quad (-2,3), (0,8), (3,-7)$

no yes no

12. 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.

t, n

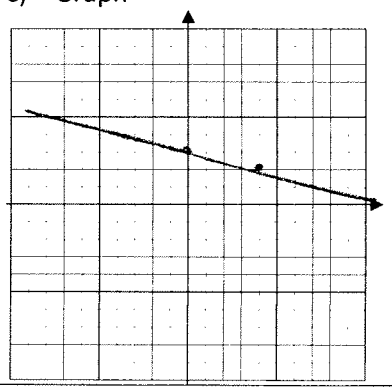
In 2005, the average number of cars sold per week by a car dealership was 25.

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

a) y-intercept as an ordered pair: $(0,3)$

b) Slope: $-1/4$

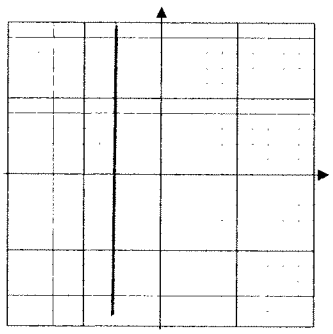
c) Graph



14. Graph the line that has the given slope and contains the given point.

m *is undefined*, $(-3,4)$

vertical



Page 4

I need to see all work for credit! No work means no credit

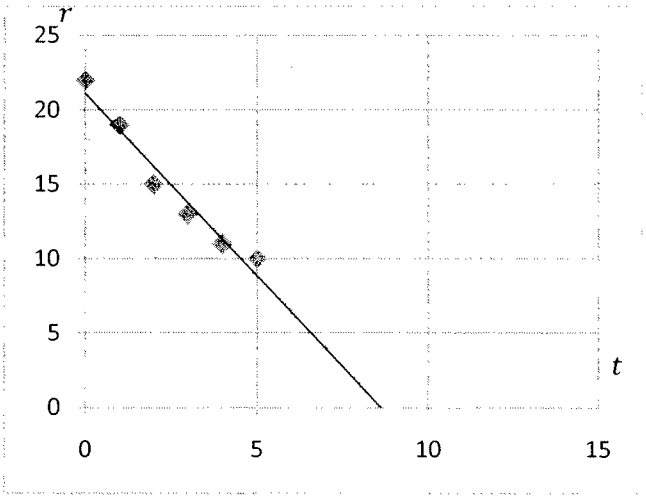
15. Perform the indicated operations and simplify your answers. *Show all work for credit!*
Unless otherwise specified, your answers should be integer or simplified fraction.

a) $\frac{2}{11}\cdot\frac{3}{7}$ $\frac{6}{77}$	b) $\frac{2}{3}\div 6$ $\frac{1}{9}$	c) $\frac{3}{14}+\frac{5}{4}$ $\frac{41}{28}$
d) $-\frac{1}{11}-\left(-\frac{10}{11}\right)$ $\frac{9}{11}$	e) $\left(\frac{3}{5}\right)^2$ $\frac{9}{25}$	f) $\frac{3}{7}\left(-\frac{4}{5}\right)$ $-\frac{12}{35}$

16. 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.

notice that this is an apparent linear model

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



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

(0, 21)

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

According to the model, the average bumping rate was 21 per 10,000 passengers in 2000.

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.

In 2006, the voluntary bumping rate was 6 bumps per 10,000 passengers

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.

According to the model, in 2007, the bumping rate was 4 per 10,000 passengers.