

Answers to Study Guide for Midterm Two

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.



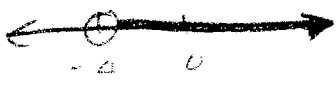
In general, **do not use mixed numbers**. Instead, **use improper fractions** from here on out.

1. Simplify the expression or solve the equation, as appropriate.

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

a) $-8 = \frac{4x}{7}$ $X = -14$	b) $5(x - 2) - (3x + 6) = 6(5x + 3)$ $X = -\frac{17}{4}$	c) $-5.5 + 4.6(3.5x - 9.1)$ Round your answer to the nearest tenth. $16.1x - 47.4$
d) $\frac{5}{6} + 2x + 5 - \frac{7}{9}x$ $\frac{35}{6} + \frac{11x}{9}$	e) $\frac{2}{9}(15x + 6)$ $\frac{10}{3}x + \frac{4}{3}$	f) $\frac{7x}{8} + \frac{1}{2} - \frac{3x}{4} = 0$ $X = -4$

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

a) $5(x - 2) \geq 15$ ineq: $x \geq 5$ int not: $[5, \infty)$ graph 	b) $\frac{3}{4}t - \frac{1}{2} \leq \frac{1}{4}$ ineq: $t \leq 1$ int not: $(-\infty, 1]$ graph 	c) $\frac{2b-4}{3} < \frac{3b-4}{4}$ ineq: $b > -4$ int not: $(-4, \infty)$ 
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3. Determine whether the pair of lines is parallel, perpendicular, or neither.

Compare slopes of linear eqns in slope-intercept form for this problem

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

Perpendicular

4. 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.

-135. Each year the country's oil exports decreases by an average of 135 million barrels.

↑ don't forget the units!

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

- a) -8 times the difference of the number and 3.
i. Translate the English phrase into a mathematical expression.

$$-8(x-3)$$

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

$$136$$

- b) Two times the difference of a number and 7 is -10 .
i. Translate the English phrase into a mathematical equation.

$$2(x-7) = -10$$

- ii. Solve the equation.

$$x = 2$$

6. Find the equation of the line that fits the description. Write your answer in slope-intercept form (if appropriate). Use integers or simplified fractions for any numbers in your answer.

- a) Passes through $(-2, -3)$ and $(-8, -7)$

$$y = \frac{2}{3}x - \frac{5}{3}$$

- b) Passes through $(8, -7)$ and has zero slope.

$$y = -7$$

- c) Passes through $(9, 5)$ and has undefined slope.

$$x = 9$$

- d) Passes through $(5, -3)$ and has slope $\frac{4}{5}$

$$y = \frac{4}{5}x - 7$$

no decimals
leave fractions
as improper if
necessary.
Do not use
mixed numbers

7. 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.

a) Which variable is the independent variable? t

b) What is the slope? What does it mean in this situation?

$-.38$ Each year the percentage of mothers who smoke cigarettes during pregnancy decreases by .38%

c) What is the p -intercept as an ordered pair? What does it mean in this situation?

$(0, 13.9)$ In 1995, 13.9% of mothers smoked cigarettes during pregnancy

d) Find the equation of a linear model to describe the data

$$p = -.38t + 13.9$$

← use the same variables used in problem

e) What is the t -intercept as an ordered pair? What does it mean in this situation?

$(32, 0)$ In 2027, there will be no mothers smoking cigarettes during pregnancy

f) Predict the percentage of mothers who smoke cigarettes during pregnancy in 2010. Show all work and write your answer in a complete sentence.

In 2010, about 8.2% of mothers will smoke during pregnancy

g) 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.

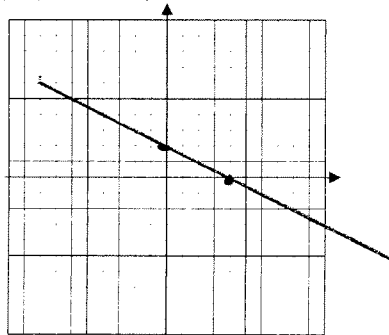
In 2008 the percentage of mothers who smoke during pregnancy will reach 5%

8. (8 points) Find the x-intercept and y-intercept and then graph the equation.

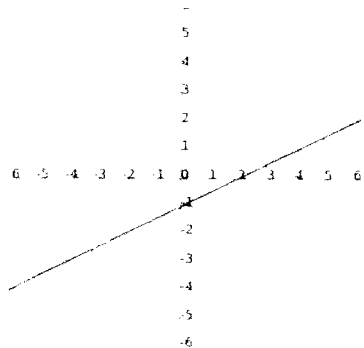
$$4x + 8y = 16$$

- a) Slope-intercept form: $y = -\frac{1}{2}x + 2$
- b) x-intercept as an ordered pair: $(4, 0)$
- c) y-intercept as an ordered pair: $(0, 2)$
- d) Graph.

need to solve for x-int by plugging in 0 for y.



9. Write the equation of the line in slope-intercept form. Simplify your answer and use integers or simplified fractions.



$$y = \frac{1}{2}x - 1$$