

Answers to Study Guide for Final Exam

1. 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.

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

$$y = -\frac{4}{7}x + \frac{26}{7}$$

2. 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) Find an equation of a linear model to describe the data. Round all numbers (including intermediate values) to two decimal places as necessary. Show all work.

$p = -.38t + 13.9$ ← use same variables as given in the problem

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

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

3. 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) $\frac{4}{15} + \frac{5}{9}$ $\frac{37}{45}$	b) $5[3 + 2(4 - 2)]$ 35	c) $9(4 - 6)^2 - 2(2 - 4)^3$ 52
d) $(-5)^2$ 25	e) $(\frac{3}{5})^2$ $\frac{9}{25}$	f) $\frac{-15(-8)}{10 - (-10)}$ 6

This is diff from $-5^2 = -25$

4. 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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ineq: $x \geq 5$

int not: $[5, \infty)$

graph:



ineq: $t \leq 1$

int not: $(-\infty, 1]$

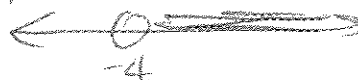
graph:



ineq: $x > -4$

int not: $(-4, \infty)$

graph:



5. Solve or simplify. Use integers or simplified fractions only in your answers. Show all work for credit!

a) $-8 = \frac{4x}{7}$ $x = 14$	b) $5(x - 2) - (3x + 6) = 6(5x + 3)$ $x = \frac{-17}{14}$	c) $\frac{6x+7}{5} = \frac{2x-7}{3}$ $x = -7$
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) $\frac{7x}{8} + \frac{1}{2} - \frac{3x}{4} = 0$ $x = -4$

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

Seven subtracted from a number is equal to 9 times the number plus 1

a) Translate the English phrase into a mathematical equation.

$$x - 7 = 9x + 1$$

b) Solve the equation.

$$x = -1$$

7. Find the x-intercept and y-intercept and then graph the equation.

$$\frac{x}{6} + \frac{y}{7} = 1$$

a) Slope-intercept form:

$$y = \frac{7}{6}x + 7$$

b) x-intercept as an ordered pair:

$$(-6, 0)$$

c) y-intercept as an ordered pair:

$$(0, 7)$$

d) Graph

graph the line using the intercepts

8. Find an equation of the line through $(9, -7)$ and parallel to $5x + 7y = 2$. Write your answer in slope-intercept form. Use only integers or simplified fractions in your answer.

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

9. Find an equation of the line through $(9, -7)$ and perpendicular to $5x + 7y = 2$. Write your answer in slope-intercept form. Use only integers or simplified fractions in your answer.

$$y = \frac{7}{5}x - \frac{98}{5}$$

10. Find the equation of the line that passes through $(9, 7)$ and has 0 slope.

$$y = 7$$

11. Find the equation of the line that passes through $(9, 7)$ and has undefined slope.

$$x = 9$$

12. Determine whether the pair of lines is parallel, perpendicular, or neither.

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

perpendicular

13. 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 ^{pregnant} mothers smoked.

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

→ $p = -.38t + 13.9$ ← use same variables as given in problem
Find before parts c & d

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

$(0, 32)$ In 2032, there will be no pregnant mothers who smoke

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 2018, the percentage of mothers who smoke during pregnancy will reach 5%.