Math 80
Winter 2009
Exam 2 Version A ANSWERS

Name_____

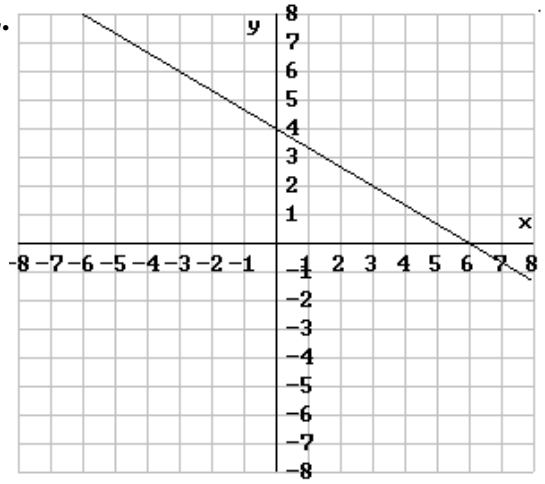
Directions: You have the full class period to complete the exam. You need a pencil and a straightedge. A basic calculator is allowed, but don't let it change the way you've been doing these problems! Be sure to follow directions carefully and show all your work. Good luck!

For numbers 1-4, write the equation of the line that is described. Put your final answer in slope-intercept form, if possible. (9 pts)

1. The line perpendicular to $y = 5x + 9$, with y-intercept $\left(0, -\frac{2}{3}\right)$

$y = -\frac{1}{5}x - \frac{2}{3}$

2.



$y = -\frac{2}{3}x + 4$

3. A vertical line that passes through $(4,1)$

$x = 4$

4. Passes through $(-2,2)$ and $(2,-8)$

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

Use the following information to answer problems 5-7 (9 pts):

A student found that relationship between the number of hours he studies the day before an exam and his exam score out of 100 points is linear. Suppose that when he studies only 2 hours, he gets 60 points. When he studies 5 hours, he gets 90 points.

5. Write a linear equation to express the number of points he gets, p, in terms of h, the number of hours he studies the day before an exam.

$p = 10h + 40$

6. Use your equation to predict the number of points he gets if he studies 3.5 hours.

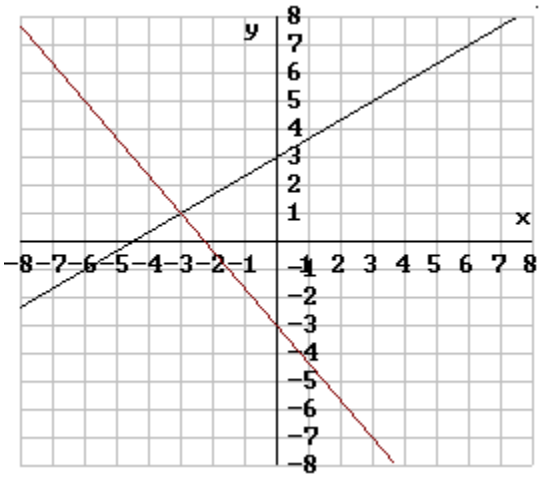
He will get 75 points if he studies 3.5 hours.

7. Explain the meaning of the slope in this example. Be specific to this example.

For every additional hour he studies, he gets 10 more points on the test.

8. Solve the system of equations **by graphing**. Write the solution as an ordered pair, if possible. (4 pts)

$$\begin{cases} \frac{2}{3}x - y = -3 \\ 3y + 4x = -9 \end{cases}$$



$(-3,1)$

9. Solve the system of equations **using either substitution or elimination**. (4 pts)

$$\begin{cases} \frac{c}{2} + \frac{d}{14} = 1 \\ \frac{c}{5} - \frac{d}{2} = -\frac{33}{10} \end{cases}$$

$(1,7)$

Solve numbers 10 and 11 by defining **two** variables and writing and solving a **system of two equations**. Be sure to answer **in a complete sentence**. (10 pts)

10. During his lunch shift at the Burger Barn, Andy sold 12 single hamburgers and 10 double hamburgers, totaling $58.40. The next day, he sold 6 singles and 16 doubles, totaling $64.40. How much did each type of burger cost?

A single hamburger costs $2.20 and a double costs $3.20.

11. A store sells regular coffee for $8 a pound and gourmet coffee for $14 a pound. How many pounds of each should be used to get 120 lbs of a mixture that will sell for $10 a pound?

Forty pounds of gourmet coffee should be mixed with 80 pounds of regular coffee.

12. Suppose that you try to solve a system of linear equations in two variables by elimination, and the result of your algebra is $0 = 7$. What can you say about the graphs of the two lines? (2 pts)

The two lines are parallel.

For numbers 13-15, perform each operation. Simplify your answer as much as possible by combining like terms. (6 pts)

13. $\left(\frac{1}{3}x^2 - 7x - 3\right) - \left(\frac{11}{6}x^2 - 9x\right)$

$-\frac{3}{2}x^2 + 2x - 3$

14. $\left(t^2 - 5\right)\left(t^2 - 6\right)$

$t^4 - 11t^2 + 30$

15. $\left(r^2 + 3\right)\left(r^2 + 2r + 5\right)$

$r^4 + 2r^3 + 8r^2 + 6r + 15$