

**Unit 2 Study Guide - Test Friday, 9/29**

**Parallel and Perpendicular Lines**

Write an equation in slope-intercept form for the line that passes through the given point and is **parallel** to the given equation.

1.)  $(5, -1); y = -\frac{3}{5}x - 3$

2.)  $(-2, 5); 2y = 4x - 6$

3.)  $(1, 7); -6x + y = -1$

Write an equation in slope-intercept form for the line that passes through the given point and is **perpendicular** to the given equation.

4.)  $(-9, 2); y = 3x - 12$

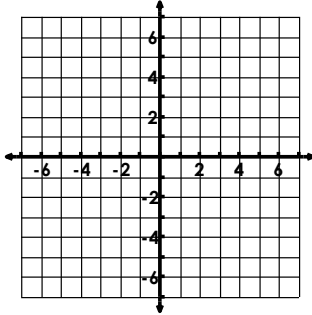
5.)  $(7, 10); y = \frac{1}{2}x - 9$

6.)  $(-4, -1); y = \frac{4}{3}x + 6$

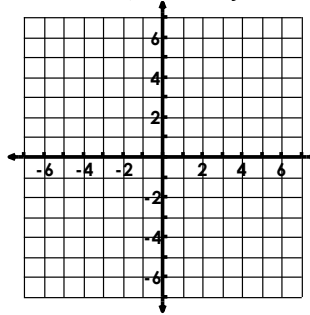
**Systems of Equations**

Solve by graphing:

7.)  $\begin{cases} y = -x - 2 \\ x + y = 3 \end{cases}$



8.)  $\begin{cases} y = x + 2 \\ 3x - 12y = 12 \end{cases}$



Solve by substitution:

9.)  $\begin{cases} -7x + 8y = 6 \\ x + 4y = -6 \end{cases}$

10.)  $\begin{cases} 8x + 2y = 16 \\ x - y = 7 \end{cases}$

Solve by elimination:

11.)  $\begin{cases} 12x - 8y = 12 \\ 6x - 7y = -12 \end{cases}$

12.)  $\begin{cases} 9x + 3y = -24 \\ -7x - 4y = 7 \end{cases}$

Solve using any method:

13.)  $\begin{cases} -3x + y = 17 \\ 8x + 7y = 3 \end{cases}$

14.)  $\begin{cases} x = 5y + 10 \\ 3x - 15y = 15 \end{cases}$

15.) Amy's school is selling tickets to a chorus concert. A senior citizen's ticket is \$6 and a child's ticket is \$15. If they made \$810 and sold a total of 72 child and senior citizen tickets, how many of each ticket did they sell?

16.) The band is selling wrapping paper for a fundraiser. Customers can buy rolls of plain wrapping paper and rolls of shiny wrapping paper. The band sold a total of 55 rolls and made \$950. If a roll of plain costs \$14 and a roll of shiny costs \$20, how many rolls of each did they sell?

### Solving Inequalities

Solve and graph each of the following.

17.)  $-5(x - 9) < 27 - 7x$

18.)  $-\frac{3}{4}x - 5 > 16$

19.)  $-1 < 2n + 3 \leq 15$

20.)  $-2y + 5 \geq -3$  or  $3y - 8 > 25$

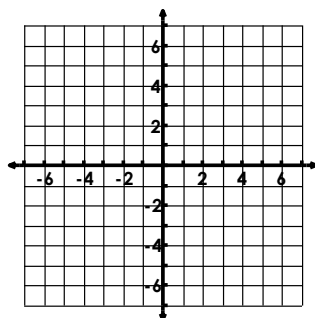
21.) The target heart rate during exercise for a 15 year old is between 154 and 174 beats per minute, inclusive. Write a compound inequality to show the heart rates that are within the target range. Graph the solutions.

22.) Edward is determined to get an A in math class. His overall grade is the average of the five tests given during the first semester. So far, Edward has scored 92, 89, 76, and 95 on his tests. What does Edward need to score on the fifth test to have an average of at least 90?

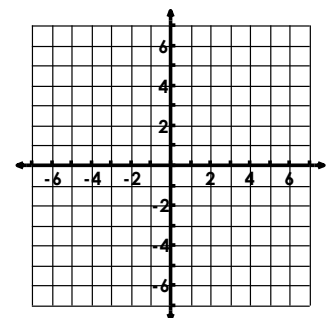
### Systems of Inequalities

Graph the solution of the systems of inequalities.

23.) 
$$\begin{cases} y > -2x - 3 \\ y \leq \frac{1}{2}x + 2 \end{cases}$$



24.) 
$$\begin{cases} 6x - 6y \geq -6 \\ 2x + 2y < -6 \end{cases}$$

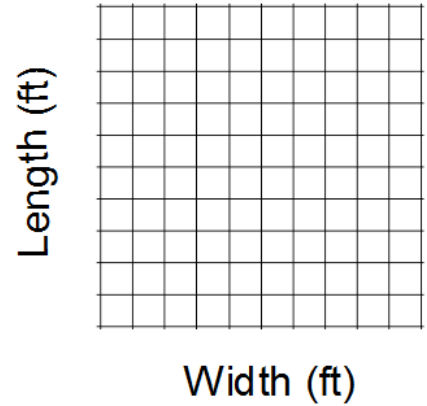


25.) A zoo keeper wants to fence a rectangular habitat for goats. The length of the habitat should be at least 80 feet, and the distance around it should be no more than 310 feet. What are the possible dimensions of the habitat?

a.) Write the system of inequalities and include all logical constraints.

b.) Graph the mathematical model.

c.) Would a width of 20 and a length of 100 work? How do you know?

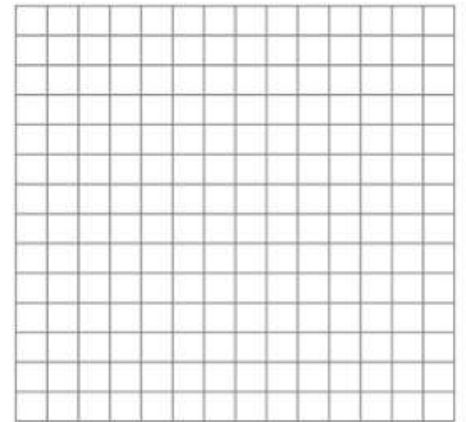


26.) You can work a total of no more than 40 hours each week at your two jobs. Waitressing pays \$10 per hour and your babysitting job pays \$8 per hour. You need to earn at least \$240 each week to pay your bills.

a.) Write the system of inequalities and be sure to include all logical constraints.

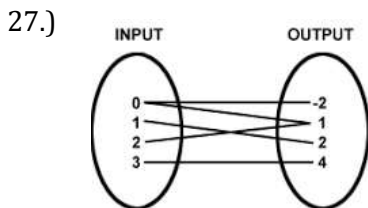
b.) Graph the mathematical model. Graph the number of hours waitressing on the x-axis and the number of hours babysitting on the y-axis. Be sure to label your axes.

c.) Why does the graph only fall in the 1<sup>st</sup> Quadrant?



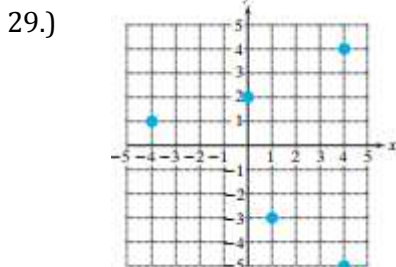
**Relations and Functions**

Determine whether each relation is a function. Briefly explain. Identify the domain and range.



28.)

$x$	0	1	2	3
$f(x)$	1	3	5	7



30.)  $\{(-2, 4), (1, 8), (-1, -2), (2, 4), (1, 9)\}$

31.) If  $f(x) = 3x + 1$ , then find the following:

a.)  $f(1)$

b.)  $f(-2)$

c.)  $f(x) = -8$

d.)  $f(x) = 16$

32.) Evaluate the following expressions given the functions below:

$$g(x) = -3x + 1$$

$$f(x) = x^2 + 7$$

$$h(x) = \frac{12}{x}$$

$$j(x) = 2x + 9$$

a.)  $g(10)$

b.)  $f(3)$

c.)  $h(-2)$

d.)  $j(7)$

e.)  $h(a)$

f.)  $g(x) = 16$

g.)  $h(x) = -2$

h.)  $f(x) = 23$

Challenge:  $g(f(x))$