Name_____ Date _____

Define the following terms, and provide an example:

Domain:

Range:

Slope Intercept form:

Point Slope Form:

Standard Form of a linear equation:

Function:

Rate:

Parallel lines:

Perpendicular:

Reciprocal:

Scatter plot:

Correlation:

Line of fit:

Sequence:

Term:

Arithmetic sequence:

Common difference:

Function notation:

Piecewise function:

Step function:

Absolute value function:

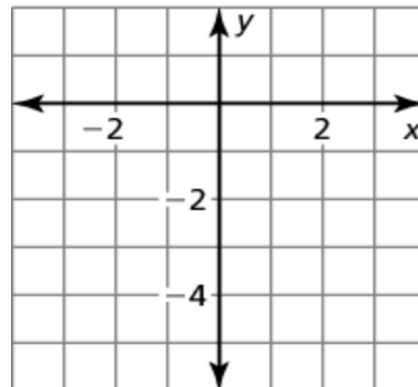**<u>Vertex form:</u>**

<u>Vertex:</u>

State the domain and the range of the function.

1. $f(x) = \begin{cases} -\frac{3}{4}x - 1, & \text{if } x < 4 \\ 3, & \text{if } x \geq 5 \end{cases}$

2. $g(x) = \begin{cases} 4 - x, & \text{if } 1 < x < 4 \\ -2, & \text{if } -1 \leq x < 1 \\ 3, & \text{if } x < -1 \end{cases}$

3. Graph the function.

$h(x) = \begin{cases} \frac{2}{3}x - 5, & \text{if } x > 0 \\ -\frac{1}{2}x - 3, & \text{if } x \leq 0 \end{cases}$

Write the slope-intercept form of the equation with the given characteristics.

4. slope $= \frac{2}{5}$; passes through $(-3, 1)$

5. passes through $(3, 5)$ and $(-1, 5)$

6. parallel to the line $2x - y = 7$; passes through $(-5, -3)$

7. perpendicular to the line $y = -\frac{3}{2}x - 7$; passes through $(-3, -4)$

8. perpendicular to the line $2x - 5 = -11$; passes through $(7, 5)$

9. slope $= \frac{1}{2}$; x-intercept $= 3$

10. slope $= -3$; passes through $(4, -7)$

11. parallel to the line $2x - 5y = -20$; passes through $(7, 6)$

12. perpendicular to the line $y = 3x + 8$; passes through $(-4, 1)$

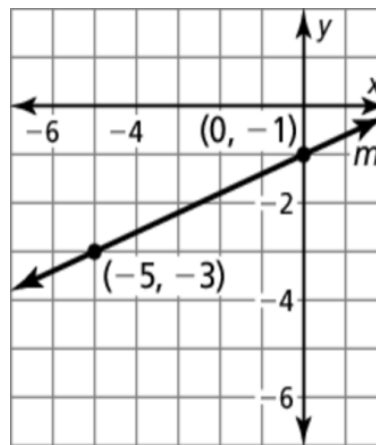**Determine if the sequence is arithmetic. If so, find the common difference.**

13. $-3, -1, 3, 5, \ldots$

14. $-1, -7, -13, -19, \ldots$

15. $-\dfrac{1}{6}, \dfrac{1}{6}, \dfrac{1}{2}, \dfrac{5}{6}, \ldots$

16. $-1.2, -0.1, 0.8, 1.7, \ldots$

17. Line m represents a translation of line ℓ 2 units up and 3 units right. Write an equation that represents the equation of line ℓ.

18. The table shows the number of women (in millions) in the U.S. work force at various times during the past century.

Year, x	1900	1920	1930	1950	1970	1990
Number, y	5	8	10	16	31	57

a. Make a scatter plot of the data. Describe the correlation.

b. Use a graphing calculator to find an equation of the line of best fit.
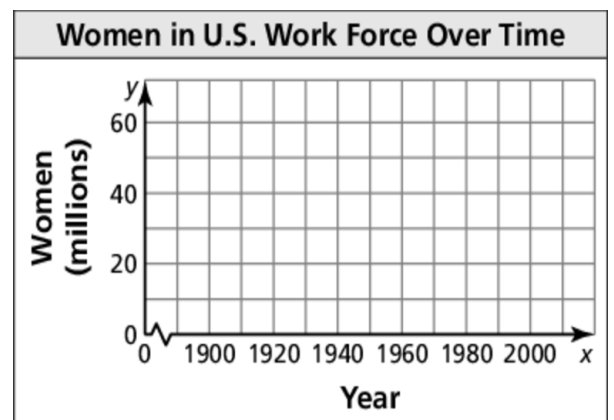
Determine if the given lines are parallel, perpendicular, or neither.

19. $2x - 3y = 9$

$4x - 5y = 15$

20. $x = 5$

$2x - 3 = 15$

21. $2 - x = 3y$

$2y + 10 = 6x$

22. $y + x = \frac{1}{2}x + 1$

$2x - y = 3$

Tell whether a correlation is likely in the situation. Explain your reasoning.

23. The amount of gas in a car's tank and the number of miles driven

24. The height of a person and the length of the person's hair

Chapter 5

Define the following terms:

Systems of Linear Equations:

Solution of a system of linear equations:

Coefficient:

Parallel:

Perpendicular:

Linear inequality in two variables:

Solution of a linear inequality in two variables:

Graph of a linear inequality:

Half-planes:

Ordered pair:

System of linear inequalities:

Solution of a system of linear inequalities:

Graph of a system of linear inequalities:

Solve the system of linear equations using any method.

1. $x - 5y = -30$
   $3x + 5y = 10$

2. $x + 2y = -3$
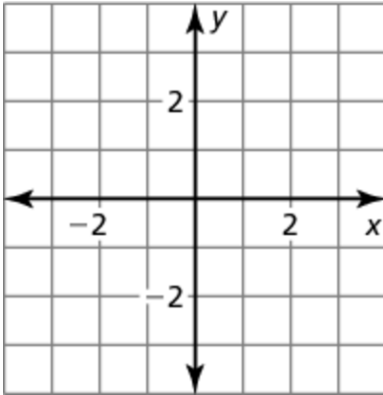 $-5x + 2y = 51$

3. $-5x - 4y = -15$
   $10x + 8y = 30$

4. $y = 2x + 3$
   $-4x + 2y = 8$

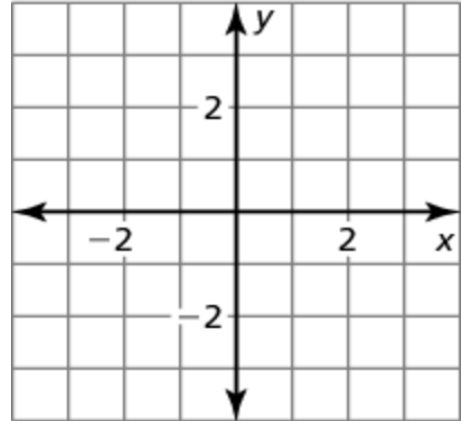5. $y = -5x + 6$
   $2x + y = 6$

6. $x = -y - 1$
   $-5x + 2y = -65$

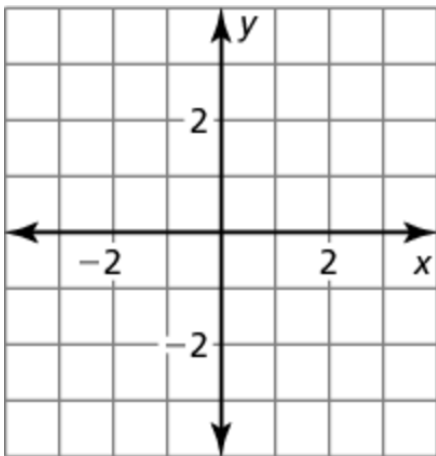**Graph the inequality in a coordinate plane.**

7. $y > 0$

8. $2x - 5y \le -10$

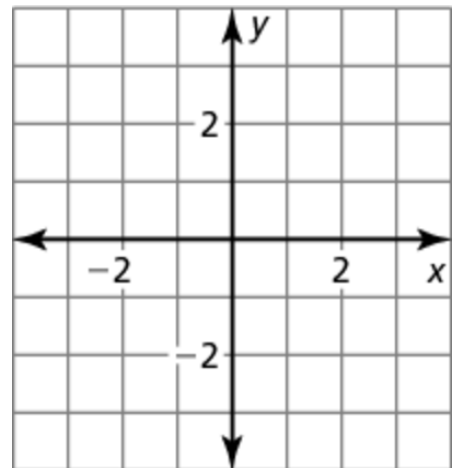**Graph the system of linear inequalities.**

9. $3x + 2y \ge -2$

   $x + 2y \le 2$

10. $2x - 3y \ge 6$

    $-4x + 6y \le -18$

11. Write an expression that you can substitute for x in the top equation of the system below to solve the system by substitution.

$5x - 2y = 8$

$x - y = 1$

12. You have $8.80 in pennies and nickels. You have twice as many nickels as pennies. Write a system of linear equations that models the situation. How many of each type of coin do you have?

Compare the slopes and _y_-intercepts of the graphs of the equations in the linear system to determine whether the system has one solution, no solution, or infinitely many solutions. Explain.

13. $x = -3y + 28$

$x + 4y = 36$

14. $2x + 3y = 11$

$-4x - 6y = -22$

15. $x + 2y = 3$

$-2x - 4y = -20$

16. You make $5 an hour in tips working at a video store and $7 an hour in tips working at a landscaping company. You must work at least 4 hours per week at the video store, and the total number of hours you work at both jobs in a week cannot be greater than 15.

a. Write a system of linear inequalities to model the number of hours that you could work at each location in a week.
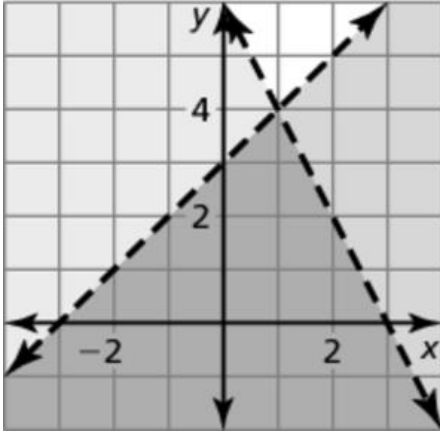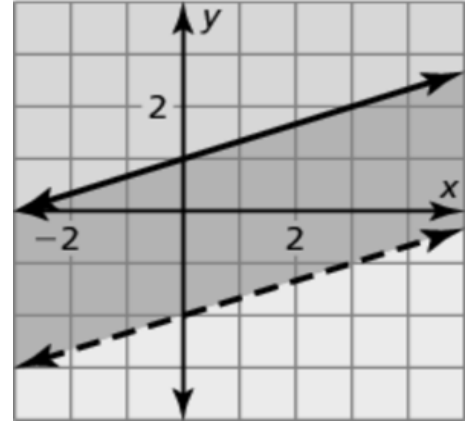
b. Graph the system of linear inequalities.

Hours Worked in a Week

Hours at landscaping company (y-axis, marked 0, 4, 8, 12)

Hours at video store (x-axis, marked 0, 10, 20)

c. Write an equation that models the total tips you receive from the two jobs.

d. Identify and interpret a solution of the system.

Write a system of linear inequalities represented by the graph.

17.

18.

Solve the equation by graphing. Check your solutions.

19. $2x - 3 = x + 2$

20. $|x - 1| = |2x - 5|$

21. $|-x| = |2x - 3|$

Chapter 6

Define the following:

Power:

Exponent:

Base:

Scientific notation:

Square Root:

n th root of a:

Radical:

Index of a radical:

Simplify the expression. Write your answer using only positive exponents.

1. $\dfrac{12x^{-5}y^3}{3^{-2}x^{-2}y^{-4}}$

2. $\left(5x^4y^0\right)^{-3}$

3. $\left(-\dfrac{1}{2a^{-2}}\right)^{-3}$

Rewrite the expression as a power of a product.

4. $9x^6y^8$

5. $64x^9y^9$

Evaluate the expression.

6. $\left(27\right)^{-2/3}$

7. $-\sqrt[3]{-125}$

8. $\left(8\right)^{2/3} \bullet \left(27\right)^{-1/3}$