Algebra 2 – Terms 1 & 2 **NAME** _____

Baseline Test for Student Growth *Limestone Community High School*

Chapter 1
Evaluate Expressions & Formulas

1. Evaluate the expression if

$a = -3, \quad b = -1.8, \quad \text{and } c = 4$

$$\frac{bc}{a-b}$$

2. Solve using the given formula.

$$F = \frac{9}{5}C + 32$$

The temperature within our classroom is about 86 °F. What would be the temperature in degrees Celcius?

Chapter 1
Re-Write Expressions & Formulas

3. Re-write the equation by solving for ***x.***

$$y = 3x - 4$$

4. The formula for finding the perimeter ***P***, of a rectangle, given its length ***l***, and its width ***w***, is below.

$$P = 2l + 2w$$

Re-Write the formula to find a rectangle's width given its perimeter and length.

5. If

$$5x + 6 = 10$$

What is the value of

$$10x + 3 = ?$$

6. Kathy is a repair technician for a phone company. Each week, she receives a batch of phones that need repairs. The number of phones that she has left to fix at the end of each day can be estimated with the equation

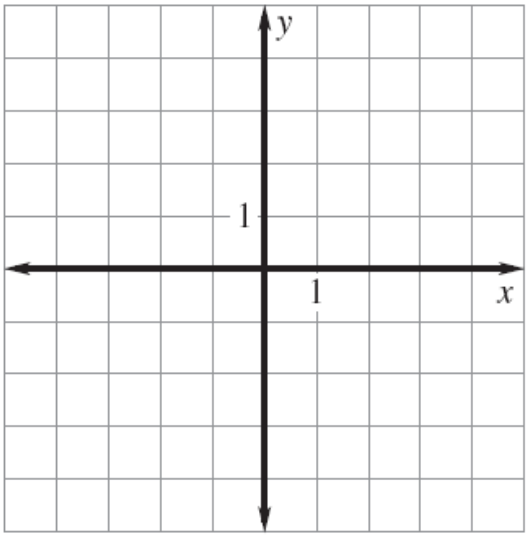
$$P = 108 - 23d$$

Where ***P*** is the number of phones left and ***d*** is the number of days she has worked that week. What is the meaning of the value 108 in this equation?

Chapter 1
Solve Linear Equations & Functions

7. Use the graph to help solve for ***x*** when

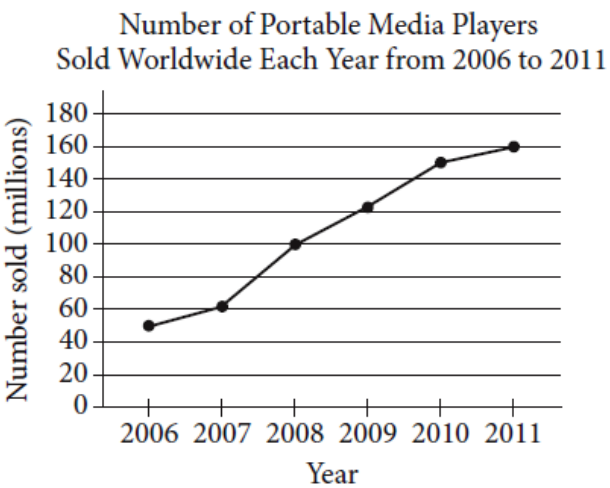
$$\frac{3x}{2} - 1 = -4$$



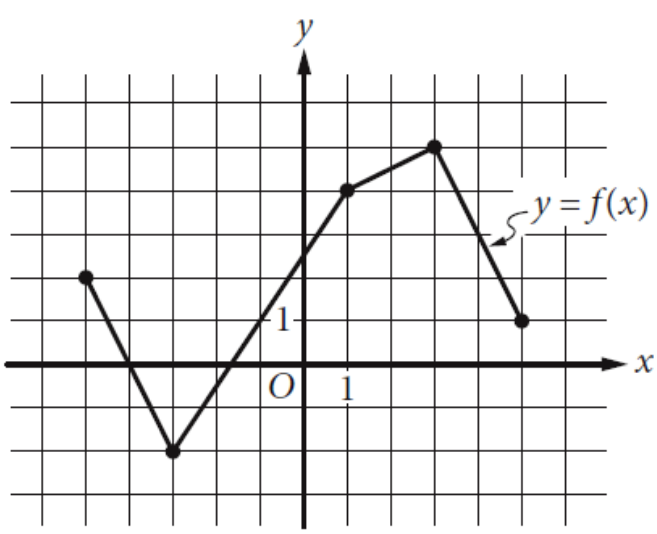
8. The posted weight limit for a covered wooden bridge in Pennsylvania is 6000 pounds. A delivery truck that is carrying x identical boxes each weighing 14 pounds will pass over the bridge. If the combined weight of the empty delivery truck and its driver is 4500 pounds, what is the maximum possible value for x that will keep the combined weight of the truck, driver, and boxes below the bridge's posted weight limit?

Chapter 2
Relations & Functions

9. What is the **Domain** of the line graph?



10. The complete graph of the function ***f*** is shown in the *xy*-plane below. For what value of ***x*** is the value of $\boldsymbol{f(x)}$ at its minimum?



Chapter 2
Function Evaluation

11. Evaluate the function value at $\boldsymbol{f(x+5)}$

$$\boldsymbol{f(x) = -3x + 10}$$

12. For the function ***g*** defined as

$$\boldsymbol{g(x) = ax^2 + 24}$$

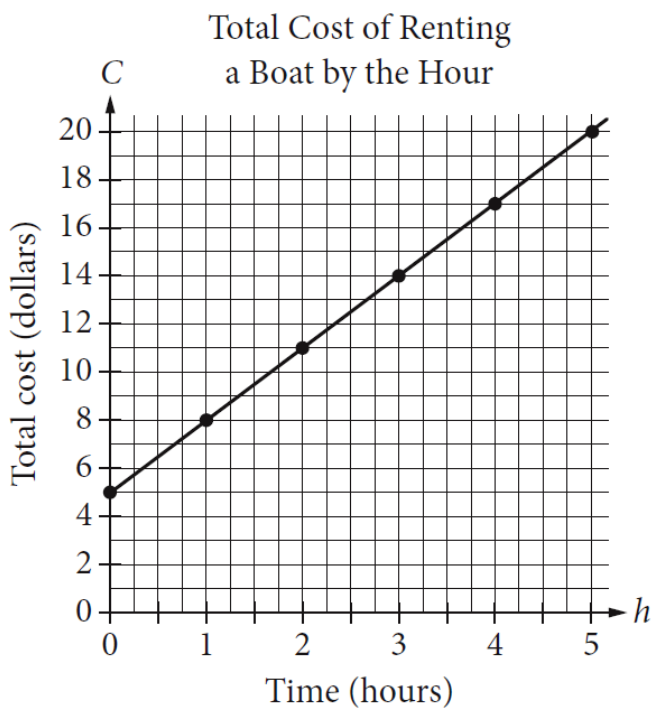
a is a constant and $\boldsymbol{g(4) = 8}$.

What is the value of $\boldsymbol{g(-4)}$?

Chapter 2
Writing Linear Relations & Functions

13. The graph of a line in the *xy*-plane has slope **2** and contains the point $(\mathbf{1}, \mathbf{8})$. The graph of a second line passes through the points $(\mathbf{1}, \mathbf{2})$ and $(\mathbf{2}, \mathbf{1})$. If the two lines intersect at the point **(a, b)**, what is the value of $\boldsymbol{a} + \boldsymbol{b}$?

14. Write an equation that represents the relationship between ***h*** and ***C*** .



Chapter 2
Rates of Change and Slope

15. Find the rate of change between the two points.

$$(\mathbf{1}, \mathbf{2})\ \boldsymbol{and}\ (\mathbf{8}, \mathbf{16});$$

$$\boldsymbol{x\ in\ weeks, y\ in\ pounds}$$

16. The line $\boldsymbol{y} = \boldsymbol{kx} + \mathbf{4}$, where ***k*** is a constant, is graphed in the *xy*-plane. If the line contains the point $(\boldsymbol{c}, \boldsymbol{d})$, where $\boldsymbol{c} \neq \mathbf{0}$ and $\boldsymbol{d} \neq \mathbf{0}$, what is the slope of the line in terms of ***c*** and ***d*** ?

17. Solve the system using Substitution.

$$y = 3x + 7$$
$$y = -2x - 8$$

18. In the equations below, ***b*** and ***c*** represent the price per pound, in dollars, of beef and chicken, respectively, ***x*** weeks after July 1 during last summer.

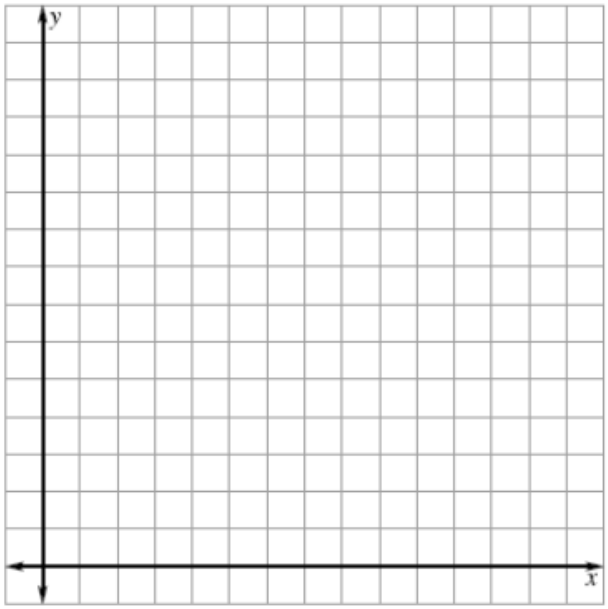
$$b = 2.35 + 0.25x$$
$$c = 1.75 + 0.40x$$

What was the price per pound of beef when it was equal to the price per pound of chicken?

Chapter 3
Solving Systems of Equations

19. Graph both lines to find the solution.

$$y = x + 2$$
$$y = -\frac{1}{2}x + 11$$



20.

$$ax + by = 12$$
$$2x + 8y = 60$$

In the system of equations above, ***a*** and ***b*** are constants. If the system has infinitely many solutions, what is the value of

$$\frac{a}{b} = ?$$

Chapter 3
Solving Systems of Equations

21. Solve the system using Elimination.

$$\mathbf{2x + 4y = 2}$$
$$\mathbf{-2x + 5y = -11}$$

22. A food truck sells salads for $6.50 each and drinks for $2.00 each. The food truck's revenue from selling a total of 209 salads and drinks in one day was $836.50. How many salads were sold that day?

Chapter 3
Linear Programming

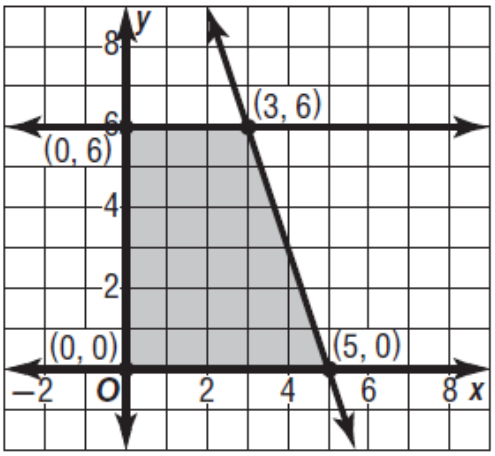
23. The function ***f*** of the 2 variables ***x*** and ***y*** is defined by:

$$\boldsymbol{f(x, y) = -2x^2 + 3y}$$

What is $\boldsymbol{f(2, -1)}$?

24. Find the maximum for the bounded region given the function

$$\boldsymbol{f(x, y) = x - 3y}$$



Chapter 1
Linear Inequalities

25. Solve.

$$3x - 5 \geq 4x - 3$$

26. Jethro can husk at least 12 dozen ears of corn per hour and at most 18 dozen ears of corn per hour. Based on this information, what is a possible amount of time, in hours, that it could take Jethro to husk 72 dozen ears of corn?

Chapter 1
Absolute Value Equations

27. Solve for x. There are 2 solutions.

$$|3x + 6| = 15$$

28. The road sign describes safe speeds at which to travel on the interstate. Write an absolute value equation that describes the speeds that are safe to drive.

29. Solve the system using Elimination.

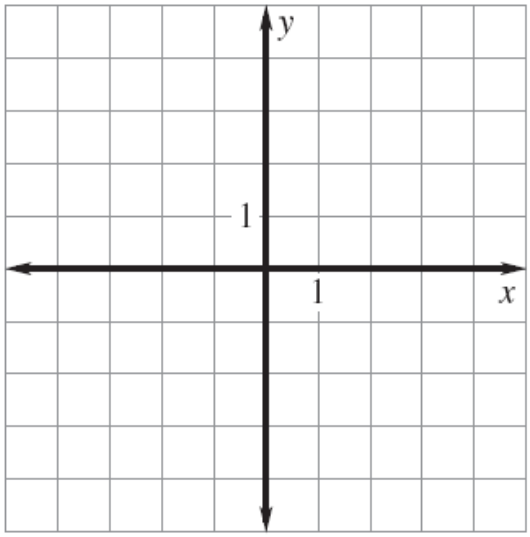
$$2x + 4y = 2$$
$$-2x + 5y = -11$$

30. A worker uses a forklift to move boxes that weigh either 40 pounds or 65 pounds each. Let x be the number of 40-pound boxes and y can be the number of 65-pound boxes. The forklift can carry up to either 45 boxes or a weight of 2,400 pounds. Write a system of inequalities that represents this relationship.

Chapter 3
Systems of Inequalities

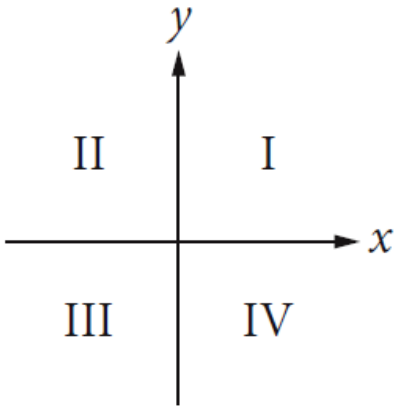
31. Graph.

$$y \geq 2x + 1$$
$$y > \frac{1}{2}x - 1$$



32. If the given system of inequalities were graphed in the xy-plane below, which quadrant would contain no solutions to the system?

$$y \geq 2x + 1$$
$$y > \frac{1}{2}x - 1$$



Chapter 4
Factoring Quadratics

33. Factor the expression.

$$9a^4 + 12a^2b^2 + 4b^4$$

34.

If

$$2x(3x + 5) + 3(3x + 5)$$

is equal to

$$ax^2 + bx + c$$

for all values of ***x***, and ***a***, ***b***, and ***c*** are constants,

what is the value of ***b*** ?

Chapter 4
Solving Quadratic Equations

35. What is the sum of all values of ***m*** that satisfy

$$2m^2 - 16m + 8 = 0$$

36. The equation below expresses the approximate height ***h***, in meters, of a ball t seconds after it is launched vertically upward from the ground with an initial velocity of 25 meters per second.

$$h = -4.9t^2 + 25t$$

After approximately how many seconds will the ball hit the ground?

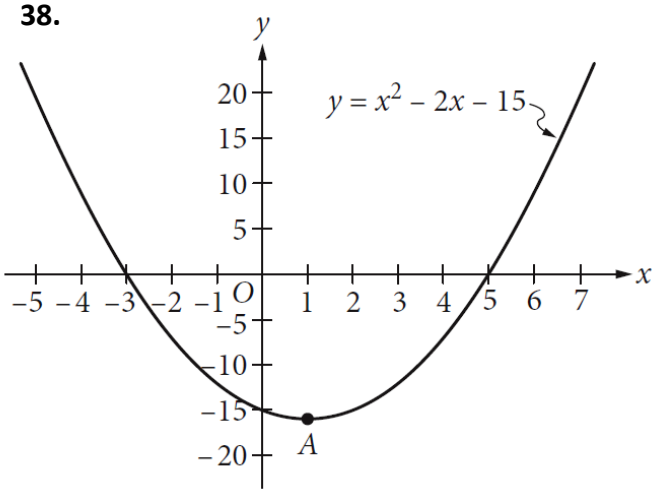
Chapter 4
Graphing Quadratic Equations

37. In the *xy*-plane, the point $(3, 6)$ lies on the graph of the function

$$f(x) = 3x^2 - bx + 12$$

What is the value of b ?

38.



Write an equivalent form of the equation of the graph shown in the xy-plane above, from which the coordinates of vertex **A** can be identified as constants in the equation.

Chapter 4
Complex Number Operations

39.

For $\sqrt{-1} = i$, *and* $i^2 = -1$,

Simplify the expression.

$$(5 - i)(1 - 2i)$$

40.

For $\sqrt{-1} = i$, *and* $i^2 = -1$,

Then what does $i^{18} = ?$