

Name: _____

Math 1
Quadratic Word Problems

- 1) The length of a rectangular lawn is 6 feet longer than the width. The area of the lawn is 391 square feet. What are the dimensions of the lawn?
- 2) The path of a projectile on the moon can be modeled by the function below, where t is the time (in seconds) and $h(t)$ is the height (in feet). $h(t) = -2.61t^2 + 48t + 5$
- a) How high was the object before it was thrown?
 - b) What is the maximum height? How many seconds does it take to reach this height?
 - c) How long does it take to land back on the moon's surface?
 - d) If the same object was thrown on earth the path would be modeled by $h(t) = -16t^2 + 48t + 5$. How long does it take this object to hit the ground?
- 3) A kicker kicks a football during practice. The equation below can be used to find the height (h) in feet of the football after t seconds. $h(t) = -16t^2 + 32t$
- a) What is the maximum height that the football reached?
 - b) How many seconds did it take to reach the ground?
 - c) How high is the football after 0.5 seconds?
- 4) A company's profits are modeled by the function $P(x) = -4.5x(x - 10) + 18$. $P(x)$ is in thousands of dollars and x represents the number of units sold per month.
- a) What is the simplified version of the rule?
 - b) How many units would have to be sold to make the highest possible profit?
 - c) What is the highest possible profit?

5) The equation $a = 0.003x^2 - 0.115x + 21.3$ models the average ages of women when they first married since the year 1940. In this equation a represents the average age and x represents the years since 1940.

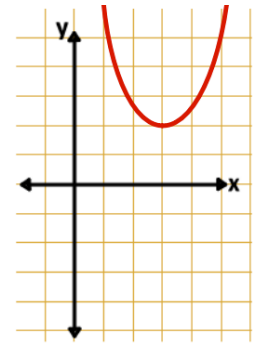
- a) What was the average age of a women who married in 1940?
- b) What year was average age of brides the youngest?
- c) What is the youngest age?

6) What is the range of the function $f(x) = (x - 2)^2 + 17$

- a) all real numbers greater than or equal to 2
- b) all real number
- c) all real numbers less than or equal to 17
- d) all real numbers greater than or equal to 17

7) What is the domain of the function graphed?

- a) all real numbers greater than or equal to $2x$
- b) all real numbers
- c) all real numbers greater than or equal to 1 and less than or equal to 5
- d) all real numbers greater than or equal to 3



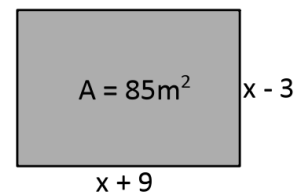
8) Dale is 5 years older than Chip. The product of their ages is 266.

- a) Write a quadratic equation that will represent the ages.
- b) How old is Dale? How old is Chip?

9) Clay built a dog pen based on the diagram below. The diagram is not drawn to scale.

- a) Write an equation that represents the area, then simplify and set equal to zero.

- b) What are the dimensions of the dog pen?



10) Vincent put his money into a mutual fund, where the amount of money he earned or lost can be found using the equation below, where M is the money Vincent earned or lost and x is time in years.

$$M = x^2 - 4x + 79$$

- a) If Vincent gained \$100, how long did he have his money in a mutual fund?
- b) After how many years will he start to gain money?
- c) Will Vincent ever lose all his money in the mutual fund?

11) The equation $s(t) = -4.9t^2 + 39.2t$, models an object that is launched from ground level directly upward at 39.2m/s.

- a) What is the height of the object when it was launched? .
- b) What is the highest point the object reaches?
- c) If the object is in the air for 6 seconds?
- d) how long does it take the object to hit the ground?

12) A company's profits are modeled by the function below, where profit $p(x)$ is in thousands of dollars and x represents the number of units sold per month.

$$p(x) = -3.5x(x - 8) + 20$$

- a) Simplify the rule.
- b) What value of x will produce the maximum profit?
- c) What is the maximum profit?

13) The function $y = 0.059x^2 - 7.423x + 362.1$ models the consumption of bread and cereal by Americans, where y represents the bread and cereal consumption in pounds, and x represents the number of years since 1900. In what year was the lowest amount of bread and cereal eaten by Americans?

- A. 1954 B. 1905 C. 1963 D. 1999

14) What is the range of the function $f(x) = x^2 - 14x + 64$

- A. all real numbers less than or equal to 15
- B. all real numbers greater than or equal to 7
- C. all real numbers greater than or equal to 15
- D. all real numbers

15) Given $f(x) = 4x^2 + 8x - 6$, what is the domain of the function?

- A. all real numbers
- B. all real numbers greater than or equal to 2
- C. all real numbers greater than or equal to 6
- D. all real numbers less than 4

16) Phil hit 8 more homeruns than Charlie did last season. The product of their home runs last season is 180. How many home runs did Charlie hit last season?