

Review for Test #11 - Quadratic Functions

Name _____ Class _____

- 1.) A baseball player throws a ball from the outfield toward home plate. The ball's height above the ground is modeled by the equation $y = -16x^2 + 48x + 6$, where y represents height, in feet, and x represents time, in seconds. The ball is initially thrown from a height of 6 feet.
 - a.) How many seconds after the ball is thrown will it again be 6 feet above the ground?

 - b.) What is the maximum height, in feet, that the ball reaches?

 - c.) How many seconds after the ball is thrown will it hit the ground? Round to the nearest tenth.

 - d.) Find the average rate of change from 0 to 1 second and explain the meaning in the context of the problem.

- 2.) Consider the function $f(x) = -(x + 3)^2 + 25$.
 - a.) Determine the vertex of the function.

 - b.) Find the domain and range of the function.

 - c.) Find the roots of the function.

- 3.) An arrow is shot into the air. A function representing the relationship between the number of seconds it is in the air, t , and the height of the arrow in meters, h , is given by:

$$h(t) = -4.9t^2 + 29.4t + 2.5$$

- a.) Complete the square for this function.
 - b.) What is the maximum height of the arrow? Explain how you know.
 - c.) How long does it take the arrow to reach its maximum height? Explain how you know.
 - d.) What is the average rate of change for the interval from $t = 1$ to $t = 2$ seconds?
 - e.) Compare your answer to the average rate of change for the interval from $t = 2$ to $t = 3$ seconds and explain the difference in the context of the problem.
 - f.) How long does it take the arrow to hit the ground? Round to the nearest hundredth of a second. Show your work or explain.
 - g.) What does the constant term (c) in the original equation tell you about the arrow?
 - h.) What does the first-degree coefficient (a) tell you about the arrow's flight?
- 4.) Given the quadratic function $f(x) = 4x^2 + 4x + 5$, answer the following questions:
- a.) Find the vertex of the function by using the equation for the axis of symmetry.
 - b.) Find the vertex of the function by completing the square to put the function in vertex form.
 - c.) Find the domain and the range of the function.

5.) A parabola intersects the x -axis at $x = -3$ and $x = 2$ and intersects the y -axis at $y = -18$. Which is an equation of the parabola?

(A) $y = 3x^2 + 3x - 18$

(C) $y = -18x^2 - 1.5x - 1$

(B) $y = -3x^2 - 3x - 18$

(D) $y = 18x^2 + 1.5x + 1$

6.) How many real roots/zeros do the following functions have? Explain your answer.

a.) $f(x) = 2x^2 + 5x + 7$

b.) $g(x) = 4x^2 - 28x + 49$

7.) Graph the following quadratic functions by identifying the key features. If necessary, round to the nearest tenth.

a.) $f(x) = 2x^2 + x - 6$

b.) $g(x) = -(x + 6)(x - 2)$

