Name _____ Date _____

What's the Point?

Deriving Quadratic Functions

Problem Set

Use your knowledge of reference points to write an equation for the quadratic function that satisfies the given information.

2. Given: vertex $(-2, -9)$ and one of two x-intercepts $(1, 0)$

3. Given: two x-intercepts $(-7, 0)$ and $(5, 0)$ and one point $(-4, -9)$

4. Given: vertex $(-4, 3)$ and y-intercept $(0, 11)$

5. Given: exactly one x-intercept $(2, 0)$ and y-intercept $(0, -12)$

6. Given: vertex $(-6, -1)$ and point $(-3, 35)$

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Use a graphing calculator to determine the quadratic equation for each set of three points that lie on a parabola.

7. (−4, 12), (−2, −14), (2, 6)

$f(x) = 3x^2 + 5x - 16$

8. (5, −56), (1, −4), (−10, −26)

9. (−8, 8), (−4, 6), (4, 38)

10. (−2, 3), (2, −9), (5, −60)

11. (0, 3), (−5, −2.4), (15, −7.8)

12. (−2, 13), (1, −17), (7, 31)

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Name: _____ Class: _____

Writing Quadratic Functions from Word Problems Homework

Write a quadratic function to represent each situation using the given information.

1. Cory is training his dog, Cocoa, for an agility competition. Cocoa must jump through a hoop in the middle of a course. The center of the hoop is 8 feet from the starting pole. The dog runs from the starting pole for 5 feet, jumps through the hoop, and lands 4 feet from the hoop. When Cocoa is 1 foot from landing, Cory measures that she is 3 feet off the ground. Write a function to represent Cocoa's height in terms of her distance from the starting pole.

2. Sasha is training her dog, Bingo, to run across an arched ramp, which is in the shape of a parabola. To help Bingo get across the ramp, Sasha places a treat on the ground where the arched ramp begins and one at the top of the ramp. The treat at the top of the ramp is a horizontal distance of 2 feet from the first treat, and Bingo is 6 feet above the ground when he reaches the top of the ramp. Write a function to represent Bingo's height above the ground as he walks across the ramp in terms of his distance from the beginning of the ramp.

3. Ella's dog, Doug, is performing in a special tricks show. Doug can fling a ball off his nose into a bucket 20 feet away. Ella places the ball on Doug's nose, which is 4 feet off the ground. Doug flings the ball through the air into a bucket sitting on a 4-foot platform. Halfway to the bucket, the ball is 10 feet in the air. Write a function to represent the height of the ball in terms of its distance from Doug.