Name _____

Lesson 6: Solving Quadratic Equations

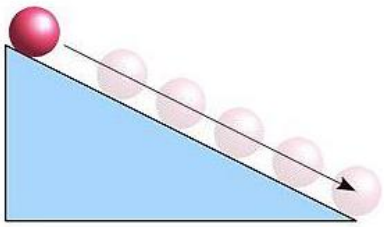
LEARNING OUTCOMES

- **I can factor a quadratic equation in order to reveal its zeros.**
- **I can find real solutions to quadratic equations in one variable using multiple methods and justify my solution method.**

Opening Exercise

Example 1

A physics teacher put a ball at the top of a ramp and let it roll down toward the floor. The class determined that the height of the ball could be represented by the equation, $h = -16t^2 + 4$, where the height is measured in feet from the ground and time in seconds.



a. What do you notice about the structure of the quadratic expression in this problem? How can this structure help us when we apply this equation?

b. In the equation, explain what the 4 represents.

c. Use the equation to determine the time it takes the ball to reach the floor.

d. Now consider the two solutions for t. Which one is reasonable? Does the final answer make sense based on this context? Explain.

Exercises: Solve each equation.

We do

1. $3x^2 - 9 = 0$

2. $(x - 3)^2 = 1$

YOU DO

3. $4(x - 3)^2 = 1$

4. $2(x-3)^2 = 12$

5. Peter is a painter and he wonders if he would have time to catch a paint bucket dropped from his ladder before it hits the ground. He drops a bucket from the top of his 9-foot ladder. The height, h, of the bucket during its fall can be represented by the equation, $h = -16t^2 + 9$, where the height is measured in feet from the ground, and the time since the bucket was dropped is measured in seconds. After how many seconds does the bucket hit the ground? Do you think he could catch the bucket before it hits?

Name _____ CW/Homework

Lesson 6: Solving Quadratic Equations

1. Factor completely: $15x^2 - 40x - 15$

Solve:

2. $4x^2 = 9$

3. $3y^2 - 8 = 13$

4. Mischief is a Toy Poodle who competes with her trainer in the agility course. Within the course, Mischief must leap through a hoop. Mischief's jump can be modeled by the equation $h = -16t^2 + 12t$, where h is the height of the leap in feet and t is the time since the leap, in seconds. At what values of t does Mischief start and end the jump?