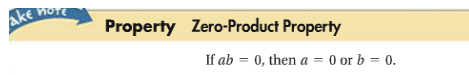## Lesson 4.5 Quadratic Equations (Clickers)

Essential Understanding: To find the zeros of a quadratic function $y = ax^2 + bx + c$, solve the related quadratic equation $0 = ax^2 + bx + c$.

Some quadratic equations can be solved using the Zero-Product Property by factoring.

ake note
Property Zero-Product Property

If $ab = 0$, then $a = 0$ or $b = 0$.

Ex. What are the solutions of the quadratic equation

$x^2 - 5x + 6 = 0$?

Ex. What are the solutions of the quadratic equation

$x^2 - 7x = -12$?

1 Solve (separate your answers with a comma):

$x^2 + 7x = 18$

2 Solve:

$9x^2 - 48 = 1$

Quadratic equations can also be solved using graphs with the help of graphing calculators.

Step 1: Go to 'y='

Step 2: Input your quadratic equation.

Step 3: Hit 'Graph'

Step 4: Hit 2nd 'Calc'

Step 5: Arrow down to 'Zeros' and hit enter.

Ex. Solve 2x² + 7x = 15

Ex. Solve x²+ 2x - 24 = 0

3 Use your calculator to solve: (round to the nearest hundredth)
$$9x^2 - 5x = 2$$

Ex. From the time Mark Twain wrote <u>The Celebrated Jumping Frog of Calaveras County</u> in 1865, frog-jumping competitions have been growing in popularity. The equation y = -.029x² + 0.59x represents the height of one frog's jump, where x is the distance, in feet, from the jump's start.

a. How far did the frog jump?

b. How high did the frog jump?

c. What is a reasonable domain and range for this problem?

Ex. The function y = -0.03x² + 1.60x models the path of a kicked soccer ball. The height is y, the distance is x, and the units are meters.

a. How far does the soccer ball travel?

b. How high does the soccer ball go?

c. Describe a reasonable domain and range for the function.