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Solving Quadratic Equations

**Solving Quadratic Equations by Factoring**

Warm-up: Factor.

To solve a quadratic equation:

1. Use the zero-product property by
2. Factor
3. Set each factor equal to zero

**Examples** Solve.

*Zeros*

*Roots*

*x-intercepts*

*all mean the same thing*

Write a quadratic equation with the given zeros:

*What are we trying to find?*

1. The height of a javelin in feet is modeled by , where t is the time in seconds after the javelin is thrown. How long is it in the air?

*What are we trying to find?*

1. Juan recorded his brother bungee jumping from a height of 1100 feet. At the time the cord lifted his brother back up, he was 76 feet above the ground. If Juan started recording as soon as his brother fell, how much time elapsed when the cord snapped back?

Use , where c is the height in feet.

1. A company plans to build a large multiplex theater. The financial analyst told her manger that the profit function for their theater was , where x is the number of movie screean, and is the profit earned in thousands of dollars. Determine the range of production of movie screens that will guarantee that the company will not lose money.

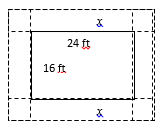
*What are we trying to find?*

Your turn…

j. After analyzing the market, a company that sells websites determines the profitability of their product was modeled by , where x is the rpice of each website and is the company’s profit. Determine the price range of the websites that will be profitable for the company.

More Word Problems!

1. A museum has a café with a rectangular patio that measures 30 feet by 20 feet. The museum wants to add 464 square feet to the area of the patio by expanding the existing patio on two sides, as shown.
   1. Find the area of the existing patio.
   2. Write an equation that you can use to find the value of *x*.
   3. Solve the equation and interpret the answer.
2. The product of two consecutive integers is 56. Find the integers.

YOU TRY:

1. Suppose you want to expand the garden shown at the right by planting a border of flowers. The border will be of the same width around the entire garden. The flowers you bought will fill an area of 276 ft2. How wide should the border be?
2. The product of two consecutive odd integers is 99. Find the integers.
3. At last year’s school fair, an 18 by 15 foot rectangular section of land was roped off for a dunking booth. The length and width of the section will each be increased by *x* feet for this year’s fair in order to triple the original area. Write and solve an equation to find the value of *x*. What length of rope will be needed to enclose the new section?