ALBERT

Name _____ Date _____

Factoring Quadratics to Find Zeros Worksheet

Algebra 1 · Common Core HSA-SSE.B.3a

> Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines.

Practice

Builds the skill step by step.

1. What are the zeros of $f(x) = (x - 3)(x + 5)$? Give the zeros from least to greatest.

2. Factor to find the zeros of $f(x) = x^2 - 5x + 6$. Give the zeros from least to greatest.

3. Factor to find the zeros of $f(x) = x^2 + 7x + 12$. Give the zeros from least to greatest.

4. Factor to find the zeros of $f(x) = x^2 - 16$. Give the zeros from least to greatest.

5. Factor to find the zeros of $f(x) = x^2 - 4x$. Give the zeros from least to greatest.

6. Why does factoring help find zeros?

   A. If a product is 0, one of the factors must be 0.

   B. Factors are always positive.

   C. Factoring makes the graph straight.

   D. It doesn't help.

7. Factor to find the zeros of $f(x) = x^2 + 2x - 15$. Give the zeros from least to greatest.

8. Factor to find the zero of $f(x) = x^2 - 10x + 25$.

9. Factor to find the zeros of $f(x) = x^2 - x - 20$. Give the zeros from least to greatest.

10. Factor to find the zeros of $f(x) = 2x^2 - 8x$. Give the zeros from least to greatest.

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On Level

Grade-level practice.

1. Factor to find the zeros of $f(x) = 2x^2 + 7x + 3$. Give the zeros from least to greatest.

2. Factor to find the zeros of $f(x) = 3x^2 - 12$. Give the zeros from least to greatest.

3. Factor to find the zeros of $f(x) = x^2 - 6x - 16$. Give the zeros from least to greatest.

4. A ball's height is $h = -16t^2 + 64t$ feet after t seconds. At what time $t > 0$ does it land?

5. What does the factored form of a quadratic show directly?

   A. its y-intercept

   B. its zeros (x-intercepts)

   C. its maximum value

   D. its slope

6. Factor to find the zeros of $f(x) = 6x^2 - x - 2$. Give the zeros from least to greatest.

7. What is the sum of the zeros of $f(x) = x^2 - 9x + 14$?

8. A rectangle is x feet wide and x + 3 feet long, with an area of 40 square feet. What is x?

9. Explain how factoring $x^2 - x - 12$ reveals the zeros of $f(x) = x^2 - x - 12$.

10. Factor to find the zeros of $f(x) = x^2 + 9x$. Give the zeros from least to greatest.

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Challenge

Multi-step and word problems that stretch it.

1. Factor to find the zeros of $f(x) = 4x^2 - 25$. Give the zeros from least to greatest.

2. Factor to find the zeros of $f(x) = -x^2 + 2x + 8$. Give the zeros from least to greatest.

3. Factor to find the zeros of $f(x) = x^3 - 9x$. Give the zeros from least to greatest.

4. How many real zeros does $f(x) = x^4 - 5x^2 + 4$ have?

5. A rocket's height is $h = -16t^2 + 48t + 64$ feet. At what time $t > 0$ does it hit the ground?

6. Which quadratic has zeros 3 and -2?

   A. $x^2 + x - 6$

   B. $x^2 - 5x + 6$

   C. $x^2 - x - 6$

   D. $x^2 + 5x + 6$

7. The parabola $f(x) = (x - 2)(x - 8)$ is symmetric about a vertical line through its vertex. What is the x-coordinate of the vertex?

8. What is the product of the zeros of $f(x) = 2x^2 - 3x - 5$?

9. A garden is x meters long and $x - 4$ meters wide, with an area of 60 square meters. How long is it?

10. Which function has zeros at 0 and 6?

    A. $f(x) = x(x + 6)$

    B. $f(x) = (x - 6)^2$

    C. $f(x) = x + 6$

    D. $f(x) = x(x - 6)$