Factoring and quadratics Worksheet

Algebra

Name _____ Date _____

Warm-up

1. Find the two numbers for $x^2 + 8x + 15$.
   Smaller: _____ Larger: _____

2. Solve: $(x + 5)(x - 7) = 0$. Write both answers, separated by a comma.

3. Find the discriminant of $x^2 - 3x + 2 = 0$.

4. Factor: $x^2 + 7x + 10$

5. Solve: $x^2 = 9$. Write both answers, separated by a comma.

Practice

6. Factor: $x^2 - 2x - 48$

7. Solve: $x^2 - 2x = 24$. Write both answers, separated by a comma.

8. How many real solutions does $x^2 + 3x + 8 = 0$ have?
   (A) One (B) Two (C) None (D) Infinitely many

9. Factor out the greatest common factor: $8x^2 + 6x$

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10. Solve: $x^2 = 7x$. Write both answers, separated by a comma.

11. Write $x = \dfrac{-b + \sqrt{b^2 - 4ac}}{2a}$ for $x^2 + 13x + 42 = 0$. What is the value?

12. Factor: $x^2 - 49$

13. Solve: $x^2 + 6x - 7 = 0$. Write both answers, separated by a comma.

Challenge

14. Factor completely: $5x^2 - 20$

15. A rectangle has area 88, and its length is 3 more than its width. What's the width?

16. For what k does $x^2 + 8x + k = 0$ have exactly one solution?

17. $x^2 + kx + 8$ factors as $(x + 1)(x + 8)$. Find k.

18. Two consecutive positive integers multiply to 380. What's the smaller?

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Factoring and quadratics Worksheet: Answer Key

Algebra

1. Smaller: 3, Larger: 5

   They multiply to 15 and add to 8.

2. $x = -5,\ 7$

   Set each factor to zero.

3. 1

   $b^2 - 4ac$ with $a = 1$.

4. $(x + 5)(x + 2)$

   Two numbers that multiply to 10 and add to 7.

5. $x = \pm 3$

   Both 3 and -3 square to 9.

6. $(x - 8)(x + 6)$

   The product is negative, so the signs differ.

7. $x = 6,\ -4$

   Get 0 on one side first, then factor.

8. (C) None

   $b^2 - 4c$ is negative.

9. $2x(4x + 3)$

   $2x$ goes into both terms.

10. $x = 0,\ 7$

    Move everything: $x(x - 7) = 0$. Dividing by x would lose $x = 0$.

11. -6

    It's the larger root: $x = -6$.

12. $(x - 7)(x + 7)$

    Difference of squares.

13. $x = -7,\ 1$

    Factor: $(x + 7)(x - 1) = 0$.

14. $5(x - 2)(x + 2)$

    Common factor first, then difference of squares.

15. 8

    $w(w + 3) = 88$. The negative solution makes no sense for a length.

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16. 16

    Set the discriminant to zero: $8^2 - 4k = 0$.

17. 9

    The middle coefficient is the sum.

18. 19

    $n(n+1) = 380$, so $n^2 + n - 380 = 0$.

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