

Zero Product Property

Solve each quadratic equation.

1. $(x + 9)(x - 5) = 0$

2. $(x - 7)(x + 12) = 0$

3. $(x - 1)(x - 13) = 0$

4. $x(x + 8) = 0$

5. $(x + 5)(5 - x) = 0$

6. $(5x + 8)(3x + 2) = 0$

7. $(2x + 3)(x - 1) = 0$

8. $(x + 6)(3x - 4) = 0$

9. $(4x + 1)(2x - 1) = 0$

10. $4(x - 11)(x - 7) = 0$

11. $3x(x - 4) = 0$

12. $(3x + 8)(2x - 17) = 0$

Factor each quadratic (rewrite as an equivalent expression to show the lengths of the sides of a rectangle).

13. $x^2 + 15x + 56$

14. $x^2 - 4x - 12$

15. $x^2 + 12x + 27$

16. $x^2 + 2x - 8$

17. $x^2 + 16x + 48$

18. $x^2 - 5x - 24$

Find the dimensions (length of the sides) of the following rectangles. Then write two equivalent expressions for the area (area as a product = area as a sum).

19.

x^2	$+3x$
$+4x$	$+12$

20.

x^2	$-6x$
$-7x$	$+42$

21.

x^2	$-4x$
$+8x$	-32

22.

x^2	$+4x$
$+4x$	$+16$

23.

$2x^2$	$+x$
$+6x$	$+3$

24.

$3x^2$	$+8x$
$+6x$	$+16$

25.

$5x^2$	$-2x$
$+20x$	-8

26.

$4x^2$	$-x$
$-12x$	$+3$

27.

$7x^2$	$-14x$
$+5x$	-10

28.

$6x^2$	$+12x$
$+2x$	$+4$

29.

$20x^2$	$-15x$
$+28x$	-21

30.

$12x^2$	$-16x$
$-15x$	$+20$

Write each of the quadratics in vertex form and then identify the vertex.

31. $f(x) = x^2 + 16x + 71$

32. $f(x) = -x^2 - 14x - 59$

33. $f(x) = 2x^2 + 36x + 70$

34. $f(x) = \frac{1}{2}x^2 + 8x + 7$

35. $f(x) = 3x^2 - 24x + 43$

36. $f(x) = -6x^2 - 12x - 13$

Sketch the graphs of the following parabolas **without** using a graphing calculator. Be sure to label the vertex. If you get stuck, a sketch of the parent graph might help.

37. $f(x) = 2(x + 2)^2 - 8$

38. $f(x) = \frac{1}{4}(x - 1)^2 + 3$

39. $f(x) = -3(x + 2)^2 + 10$

Vertex: _____ Orientation: _____

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Vertex: _____ Orientation: _____

Shift(s): _____ Stretch: _____

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