

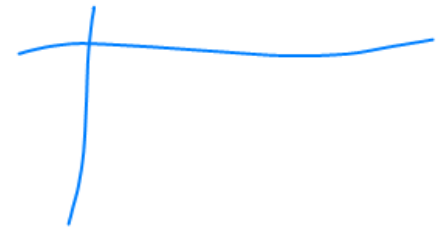
10.4 - Factoring to Solve Quadratic Equations

Vocabulary:

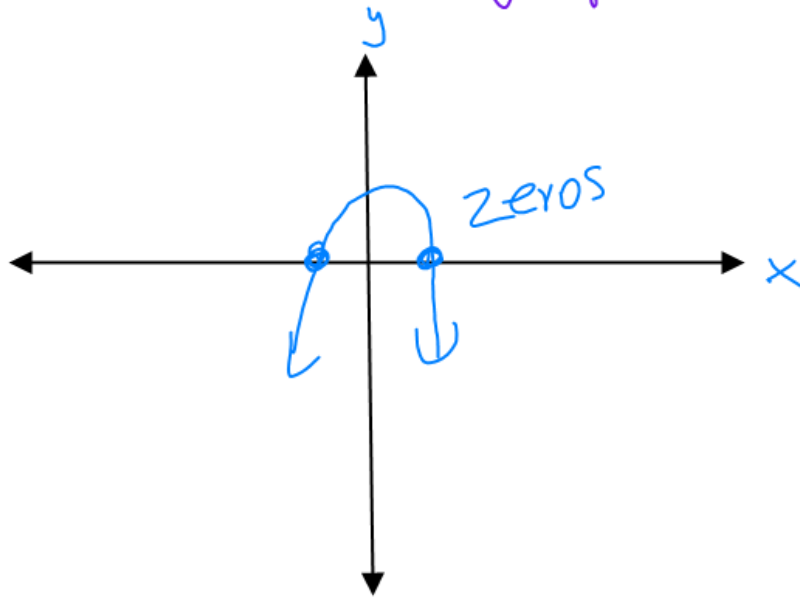
- Factor →
- Solve
- Zeros

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

$$(x + 2)(x + 2)$$



where the graph crosses the x-axis



Solve:

$$\sqrt{x^2} = \sqrt{25}$$

$$x = \pm 5$$

1 EXAMPLE Solve $(2x + 3)(x - 4) = 0$ by using the Zero Product Property.

$$(2x + 3)(x - 4) = 0$$

$$2x + 3 = 0$$

-3 -3

$$\frac{2x}{2} = \frac{-3}{2}$$

$$x = -\frac{3}{2} \text{ or } -1\frac{1}{2}$$

$$x - 4 = 0$$

+4 +4

$$x = 4$$

$$2x(x+4) = 0$$

$$\frac{2x}{2} = \frac{0}{2}$$

$$x = 0$$

$$x + 4 = 0$$
$$-4 \quad -4$$

$$x = -4$$

1 42

2 EXAMPLE Solve $x^2 + x - 42 = 0$ by factoring.

$$(x + 7)(x - 6) = 0$$

$$x + 7 = 0$$

$$-7 -7$$

$$x = -7$$

$$x - 6 = 0$$

$$+6 +6$$

$$x = 6$$

$$\begin{array}{r} \diagup -42 \diagdown \\ 7 \quad -6 \\ \diagdown 1 \diagup \end{array}$$

$$x^2 + x - 42 = 0$$

$$(x + 7)(x - 6)$$

$$x = -7$$

$$x = 6$$

Solve:

$$x^2 - 20x + 100 = 0$$

$$(x - 10)(x - 10) = 0$$

$$x - 10 = 0$$

+10

$$x = 10$$

3 EXAMPLE Solve $3x^2 - 2x = 21$ by factoring.

$$3x^2 - 2x - 21 = 0$$

$$\begin{array}{r} a \cdot c \\ -63 \\ -9 \quad 7 \\ -2 \\ b \end{array}$$

	$3x$	7
x	$3x^2$	$7x$
-3	$-9x$	-21

$$(3x+7)(x-3) = 0$$

$$\begin{array}{l} b \\ 3x+7=0 \\ -7 \end{array}$$

$$\frac{3x}{3} = \frac{-7}{3}$$

$$x = \frac{-7}{3}$$

or
 $-2\frac{1}{3}$

$$x - 3 = 0$$

$$x = 3$$

$$\text{Solve: } 2x^2 + x = 3$$

$$2x^2 + x - 3 = 0$$

$$\begin{array}{r} -6 \\ 3 \quad -2 \\ 1 \end{array}$$

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

$$2x+3=0$$

$$\frac{2x}{2} = \frac{-3}{2}$$

$$x = -\frac{3}{2} \text{ or } -\frac{1}{2}$$

$$x-1=0$$

$$x=1$$

	$2x$	3
x	$2x^2$	$3x$
-1	$-2x$	-3

Homework: pg. 574 #2, 4, 10, 14, 16, 18, 19, 20, 39, GRAPH #56

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