Math Virtual Learning

Algebra 1 S2

April 27th, 2020

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Lesson: April 27th, 2020

Learning Target:
Students will solve quadratics using completing the square.

1. [Click here](#) to practice completing the square (intro).
   *Get **four green dots** in a row.

2. [Click here](#) to practice completing the square.
   *Get **four green dots** in a row.

In today's lesson we will continue to use completing the square to solve quadratics.

Go ahead and click here to get started with today's video.

Example 1: $x^2 + 8x + 9 = 4$

Example 2: $x^2 - 16x - 4 = 0$

Example 3: $x^2 - 10x - 55 = 0$

Example 4: $x^2 - 2x - 44 = -5$

1) $x^2 + 6x - 51 = 0$

2) $x^2 - 12x - 6 = 0$

3) $x^2 - 4x - 80 = 0$

4) $x^2 + 6x - 15 = -6$

5) $x^2 + 14x + 86 = 5$

6) $x^2 - 16x + 40 = -3$

1) $x^2 + 6x - 51 = 0$

$x^2 + 6x - 51 = 0$

$ +51 \quad +51$

$x^2 + \boxed{6}x \; \underline{+9} \; = 51 \; \underline{+9}$

$(x + \underline{3})^2 = 60$

$\sqrt{(x+3)^2} = \sqrt{60}$

$x + 3 = \pm\sqrt{4} \cdot \sqrt{15}$

$x + 3 = \pm 2\sqrt{15}$

$x + 3 = \pm 2\sqrt{15}$

$ -3 \quad -3$

$\left(\dfrac{6}{2}\right)^2 = (3)^2 = 9$

$x = -3 \pm 2\sqrt{15}$

$-3 + 2\sqrt{15}$

$-3 - 2\sqrt{15}$

2) $x^2 - 12x - 6 = 0$

$$x^2 - 12x - 6 = 0$$
$$ +6 \quad\; +6$$
$$x^2 \boxed{-12}x + 36 = 6 + 36$$

$$\left(\frac{-12}{2}\right)^2 = (-6)^2 = 36$$

$$(x - 6)^2 = 42$$

$$\sqrt{(x-6)^2} = \sqrt{42}$$

$$x - 6 = \pm\sqrt{42}$$
$$+6 \qquad +6$$

★ There is <u>not</u> a perfect square that divides into 42 so $\sqrt{42}$ can <u>not</u> be simplified

$$x = 6 \pm \sqrt{42}$$

$$\boxed{\begin{array}{l} 6 + \sqrt{42} \\ 6 - \sqrt{42} \end{array}}$$

3) $x^2 - 4x - 80 = 0$

$$x^2 - 4x - 80 = 0$$

$$+80 \qquad +80$$

$$x^2 \boxed{-4}x \ \underline{+4} = 80 \ \underline{+4}$$

$$\left(-\frac{4}{2}\right)^2 = (-2)^2 = 4$$

$$(x-2)^2 = 84$$

$$\sqrt{(x-2)^2} = \sqrt{84}$$

$$x - 2 = \pm\sqrt{84}$$

$$x - 2 = \pm\sqrt{4 \cdot \sqrt{21}}$$

$$x - 2 = \pm 2\sqrt{21}$$

$$+2 \qquad +2$$

$$\longrightarrow \quad x = 2 \pm 2\sqrt{21}$$

$$\boxed{2 + 2\sqrt{21}}$$

$$\boxed{2 - 2\sqrt{21}}$$

4) $x^2 + 6x - 15 = -6$

$$+15 \quad +15$$

$$x^2 + 6x + 9 = 9 + 9$$

$$\left(\frac{6}{2}\right)^2 = (3)^2 = 9$$

$$(x + 3)^2 = 18$$

$$\sqrt{(x+3)^2} = \sqrt{18}$$

$$x + 3 = \pm\sqrt{9 \cdot \sqrt{2}}$$

$$x + 3 = \pm 3\sqrt{2}$$

$$-3 \quad -3$$

$$x = -3 \pm 3\sqrt{2}$$

$$-3 + 3\sqrt{2}$$

$$-3 - 3\sqrt{2}$$

5) $x^2 + 14x + 86 = 5$

$$-86 \quad -86$$

$$x^2 + 14x + 49 = -81 + 49 \qquad \left(\frac{14}{2}\right)^2 = (7)^2 = 49$$

$$\sqrt{(x+7)^2} = \sqrt{-32} \rightarrow \text{The square root of a}$$
negative # is a nonreal
answer

No real solutions

Additional Practice:

Click on the links below to get additional examples and practice and to check your understanding!

[Extra Video](#) for completing the square.

[Quizizz](#) for completing the square.
You can play the game or use the flashcards to practice.

[Extra Practice](#) for completing the square.