

Quadratic Formula can be used to solve for roots/zeros

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

ex.1) $3x^2 + 5x - 2 = 0$
 $ax^2 + bx + c = 0$
 $a=3 \quad b=5 \quad c=-2$

$$x = \frac{-5 \pm \sqrt{(5)^2 - 4(3)(-2)}}{2(3)}$$

$$= \frac{-5 \pm \sqrt{49}}{6}$$

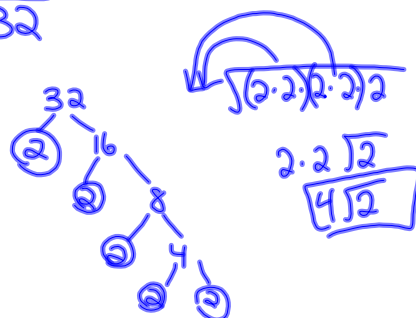
$$= \frac{-5 \pm 7}{6}$$

$\rightarrow \frac{-5+7}{6} = \frac{2}{6} = \frac{1}{3}$
 $\rightarrow \frac{-5-7}{6} = \frac{-12}{6} = -2$

Review of Simplifying Radicals

1. $\sqrt{32}$

Goal:



or perfect squares
 $\{4, 9, 16, 25, 36, 49, 64, 81, 100, \dots\}$

* choose the highest perfect square that divides into 32.

$$\sqrt{32}$$

$$= \sqrt{16 \cdot 2}$$

$$= 4\sqrt{2}$$

2. $\sqrt{12}$

$$= \sqrt{4 \cdot 3}$$

$$= 2\sqrt{3}$$

3. $\sqrt{108}$

$$= \sqrt{36 \cdot 3}$$

$$= 6\sqrt{3}$$

Determine the EXACT roots.

$$1. -2x^2 - x + 4 = 0$$

$$\text{or } 2x^2 + x - 4 = 0$$

$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(2)(-4)}}{2(2)}$$

$$x = \frac{-1 \pm \sqrt{33}}{4}$$

$$2. 2x - 8 = -x^2$$

$$x^2 + 2x - 8 = 0$$

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-8)}}{2(1)}$$

$$= \frac{-2 \pm \sqrt{36}}{2}$$

$$\begin{aligned} & \nearrow \frac{-2+6}{2} = \frac{4}{2} = 2 \\ & \searrow \frac{-2-6}{2} = \frac{-8}{2} = -4 \end{aligned}$$

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$$b) x = \frac{(12) \pm (12)\sqrt{2}}{(8)}$$

common factor 4

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