

## Math 2

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### Quadratic Formula

The quadratic formula can be used to solve <sup>finding x-int.</sup> quadratics that are in the form  $ax^2+bx+c=0$ .

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

Rearrange your equation into  $ax^2+bx+c=0$  before substituting in any values for a, b, and c.

Pay special attention to your signs!

$$\boxed{a}x^2 + \boxed{b}x + \boxed{c} = 0$$

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

Solve  $3x^2 - 4x = -4$ .

$$\boxed{3}x^2 + \boxed{-4}x + \boxed{-4} = 0$$

$$x = \frac{-\boxed{-4} \pm \sqrt{\boxed{-4}^2 - 4\boxed{3}\boxed{-4}}}{2\boxed{3}} \rightarrow +48$$

$$x = \frac{4 \pm \sqrt{16 + 48}}{6} = \frac{4 \pm \sqrt{64}}{6}$$

$$x = \frac{4 \pm 8}{6}$$

$$x = \frac{4+8}{6} = \frac{12}{6} = \boxed{2}$$

$$x = \frac{4-8}{6} = \frac{-4}{6} = \boxed{-\frac{2}{3}}$$

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Solve  $5x^2 - 2x - 1 = 0$

$$\boxed{5}x^2 + \boxed{-2}x + \boxed{-1} = 0$$

$$x = \frac{-\boxed{-2} \pm \sqrt{\boxed{-2}^2 - 4 \boxed{5} \boxed{-1}}}{2 \boxed{5}} + 20$$

$$x = \frac{2 \pm \sqrt{4+20}}{10} = \frac{2 \pm \sqrt{24}}{10} \rightarrow \begin{matrix} \sqrt{6} \rightarrow \sqrt{6} \\ \sqrt{4} \rightarrow 2 \end{matrix} > 2\sqrt{6}$$

$$x = \frac{2 \pm 2\sqrt{6}}{10} = \frac{1 \pm \sqrt{6}}{5}$$

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## More Examples

ex]  $x^2 - 7x + 12 = 0$      $a = 1$      $b = -7$      $c = 12$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(1)(12)}}{2(1)} = \frac{7 \pm \sqrt{49 - 48}}{2} = \frac{7 \pm \sqrt{1}}{2} = \frac{7 \pm 1}{2}$$

$$x = \frac{7+1}{2} = \frac{8}{2} = 4$$

$$x = \frac{7-1}{2} = \frac{6}{2} = 3$$

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