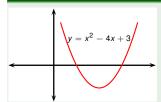
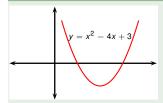
Precalculus Solve a quadratic equation

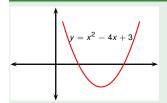
Todor Miley

2019



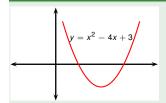


$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



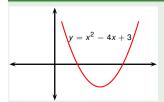
$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$



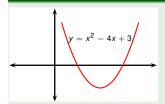
$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{\frac{2a}{2 \cdot 1}}$$

$$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$



$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

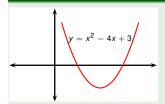
$$= \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$



$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

$$= \frac{-(-4) \pm \sqrt{(-4)^{2} - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$

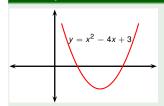
$$= \frac{4 \pm \sqrt{4}}{2}$$



$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

$$= \frac{-(-4) \pm \sqrt{(-4)^{2} - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$

$$= \frac{4 \pm \sqrt{4}}{2}$$

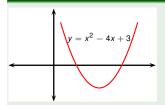


$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

$$= \frac{-(-4) \pm \sqrt{(-4)^{2} - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$

$$= \frac{4 \pm \sqrt{4}}{2}$$

$$= \frac{4 \pm \frac{2}{2}}{2}$$



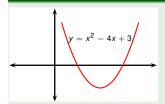
$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

$$= \frac{-(-4) \pm \sqrt{(-4)^{2} - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$

$$= \frac{4 \pm \sqrt{4}}{2}$$

$$= \frac{4 \pm 2}{2}$$

$$= \begin{cases} \frac{4 + 2}{2} \\ \frac{4 - 2}{2} \end{cases}$$



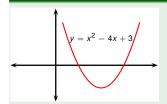
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$$= \frac{4 \pm 2}{2}$$

$$= \begin{cases} \frac{4 + 2}{2} = \frac{6}{2} \\ \frac{4 - 2}{2} \end{cases}$$



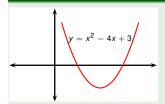
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$$= \frac{4 \pm 2}{2}$$

$$= \begin{cases} \frac{4 + 2}{2} = \frac{6}{2} = 3 \\ \frac{4 - 2}{2} = \frac{6}{2} = 3 \end{cases}$$



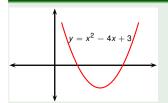
$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

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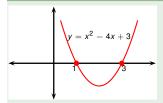
$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

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$$= \begin{cases} \frac{4 + 2}{2} = \frac{6}{2} = 3\\ \frac{4 - 2}{2} = \frac{2}{2} = 1 \end{cases}$$



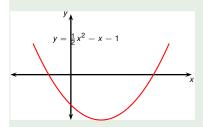
$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

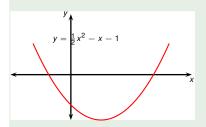
$$= \frac{-(-4) \pm \sqrt{(-4)^{2} - 4 \cdot 1 \cdot 3}}{2 \cdot 1}$$

$$= \frac{4 \pm \sqrt{4}}{2}$$

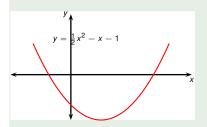
$$= \frac{4 \pm 2}{2}$$

$$= \begin{cases} \frac{4+2}{2} = \frac{6}{2} = 3\\ \frac{4-2}{2} = \frac{2}{2} = 1 \end{cases}$$



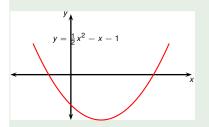


$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



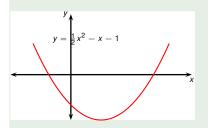
$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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



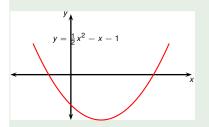
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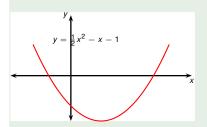
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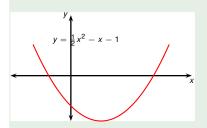
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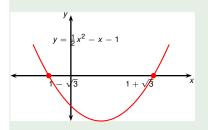
$$= 1 \pm \sqrt{3}$$



$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

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

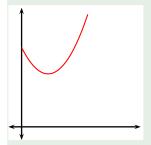
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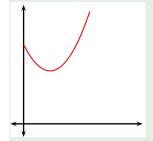


$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

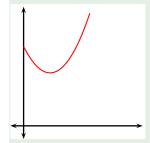
$$= \frac{-(-1) \pm \sqrt{(-1)^{2} - 4 \cdot \frac{1}{2} \cdot (-1)}}{2 \cdot \frac{1}{2}}$$

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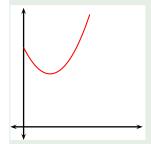


$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



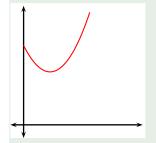
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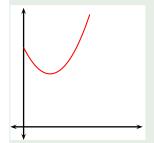
$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{\frac{2a}{2 \cdot 1}}$$

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$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

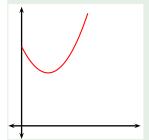
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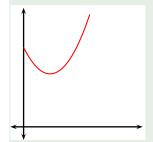
$$= \frac{2 \pm \sqrt{-8}}{2}$$



$$x_{1}, x_{2} = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

$$= \frac{-(-2) \pm \sqrt{(-2)^{2} - 4 \cdot 1 \cdot (3)}}{2 \cdot 1}$$

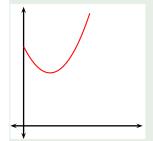
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no real solutions



$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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no real solutions
$$x - \text{intercepts}$$