

Algebra 1

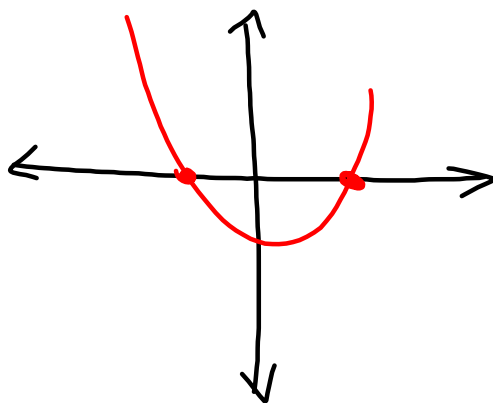
Chapter 9

Section 9-3

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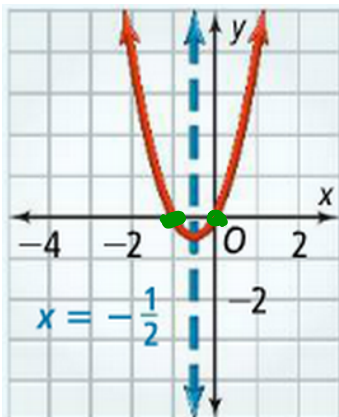
The zeros (or roots) of a function are the x-intercepts of a graph. They can be found by identifying where the graph crosses the x-axis or by using the quadratic equation:

$$ax^2 + bx + c = 0 \quad (y=0)$$



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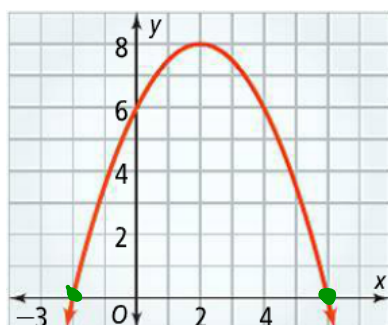
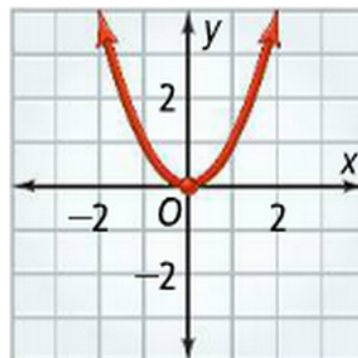
Find the zeros of each function based on the graph.



$$x = 0$$

$$x = -1$$

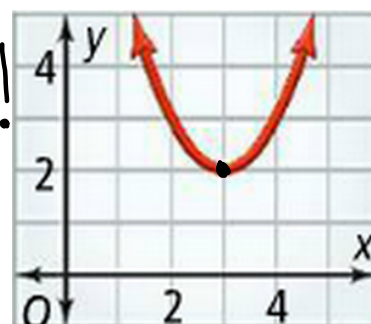
$$x = 0$$



$$x = 6$$

$$x = -2$$

none!



Apr 1-8:45 AM

Finding the zeros when $b = 0$ and $c < 0$

$$ax^2 + \cancel{(0)x} - c = 0$$

$$ax^2 - c = 0$$

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Finding the zeros when $b = 0$

$$2x^2 - 18 = 0$$

$+18 \quad +18$

- Add "c" to both sides

$$2x^2 = 18$$

$\div 2 \quad \div 2$

- Divide both sides by "a"

$$\sqrt{x^2} = \sqrt{9}$$

- Take the square root of both sides
> 2 answers, plus/minus

$$x = \pm 3$$

$$x = -3, 3$$

↑
plus
or
minus

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Solve the equations by taking square roots

$$\sqrt{x^2} = \sqrt{16}$$

$$x = 4, -4$$

$$2x^2 + 19 = 21$$

$$\color{blue}{-19 \quad -19}$$

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

$$\sqrt{x^2} = \sqrt{1}$$

$$x = 1, -1$$

$$x^2 - 25 = 0$$

$$\color{blue}{+25 \quad +25}$$

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

$$x = -5, 5$$

$$x^2 + 36 = 0$$

$$\color{blue}{-36 \quad -36}$$

$$\sqrt{x^2} = \sqrt{-36}$$

↑
negative

No solution!

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Solve the equations by taking square roots

$$5x^2 = 0$$

$$\frac{5x^2}{5} = \frac{0}{5}$$

$$\sqrt{x^2} = \sqrt{0}$$

$$x = 0$$

$$27x^2 - 12 = 0$$

$$+12 +12$$

$$\frac{27x^2}{27} = \frac{12}{27}$$

$$x^2 = \frac{12}{27}$$

$$\sqrt{x^2} = \sqrt{\frac{4}{9}}$$

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

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Solve the equation by graphing

$$x^2 + 4 = 0$$

$$x = \frac{-b}{2a}$$

$$x = \frac{-0}{2(1)} = 0$$

$$x = 0$$

$$0^2 + 4 = 4$$

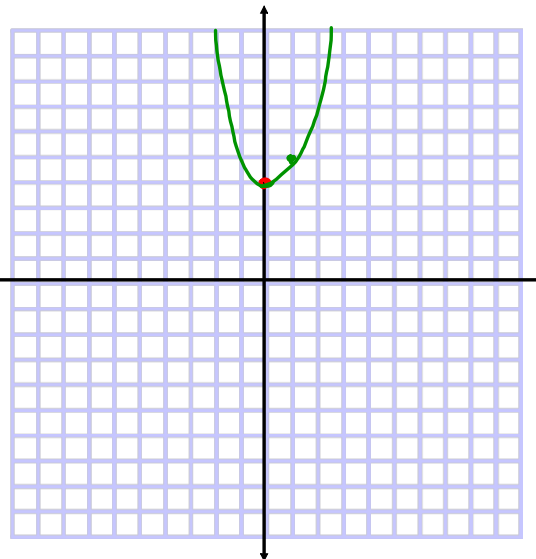
$$y = 4$$

if $x = 1$

$$y = 1^2 + 4$$

$$\text{then } y = 5$$

$$(1, 5)$$



No solution!
(Does not cross)
x-axis

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