

Graphically

Friday, March 25, 2016 12:28 PM

4.1 Solving Quadratic Equations by Graphing

A quadratic equation is an equation of the second degree.

e.g. $Ax^2 + Bx + C = 0$ $y = a(x-p)^2 + q$

$y = x^2$ $y = 3x^2 + 4$ $y = x^2 + \frac{1}{x}$

The roots of a quadratic equation are the solutions to the equation.

zero intercepts
You can find the roots of a quadratic equation by finding the x-intercepts or zeros of the corresponding quadratic function.

One method of solving a quadratic equation is by graphing the corresponding quadratic function.

Ex. #1: Solve $-3x^2 - 12x - 9 = 0$ by graphing.

$\frac{-b}{2a}$ / complete the square

$$-3(x^2 + 4x) - 9 = 0$$

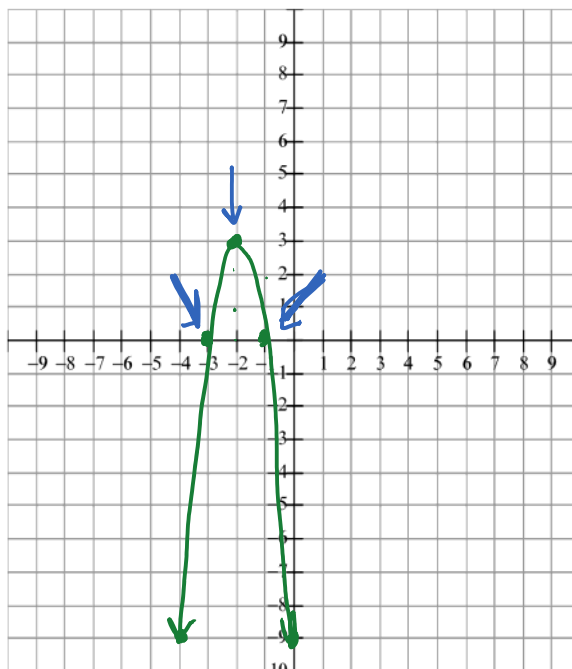
$$-3(x^2 + 4x + 4 - 4) - 9$$

$$-3(x+2)^2 - 9 + 12 = 0$$

$$-3(x+2)^2 + 3 = 0$$

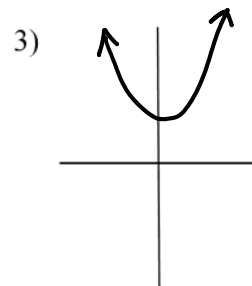
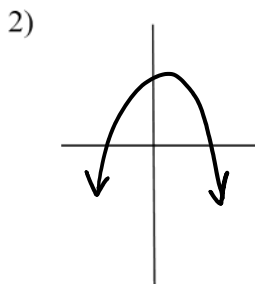
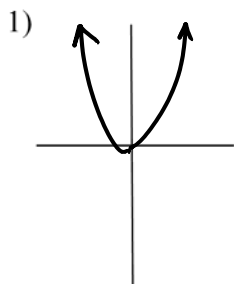
↑
Solve: zeros/roots/intercepts

$$x = -1, -3$$



$$\underline{y = \sqrt{x}} = x^{\frac{1}{2}}$$

How many solutions are possible?



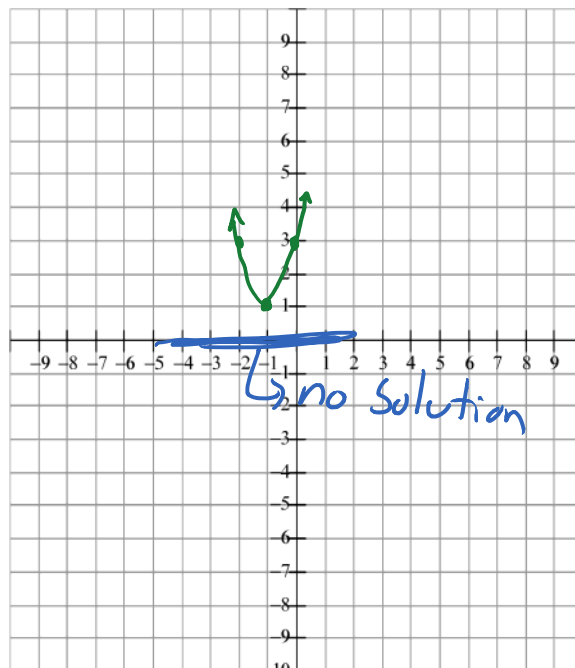
Ex. #2: Solve $2x^2 + 4x = -3$

$$2x^2 + 4x + 3 = 0$$

$$2(x^2 + 2x + 1 - 1) + 3 = 0$$

$$2(x+1)^2 + 3 - 2 = 0$$

$$2(x+1)^2 + 1 = 0$$



Homework: Solve the following by graphing.

1. $x^2 + 6x + 5 = 0$

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

3. $0 = x^2 - 2x + 2$

4. $x^2 + 4x = 5$

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

6. $2x^2 = -8x - 6$

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