

- Solving Equations Graphically *x intercepts & intersections*
- Solving Quadratic Equations
- Approximating Solutions of Equations Graphically
- Approximating Solutions of Equations Numerically with Tables
- Solving Equations by Finding Intersections

$x$	$y$
	-2
	1
	5

Solve the equation  $2x^2 - 3x - 2 = 0$  graphically.

$= f(x)$   
 $\uparrow$  Parabola

$$V \left( -\frac{b}{2a}, f\left(\frac{-b}{2a}\right) \right)$$

$$\left( \frac{3}{4}, -3.125 \right)$$

$$\left( +.75, \frac{-25}{8} \right)$$

$$\begin{array}{r} (2x + 1)(x - 2) \\ \hline x \\ -4x \\ \hline -3x \end{array}$$

$$9 - 4(2)(-2)$$

Discriminate

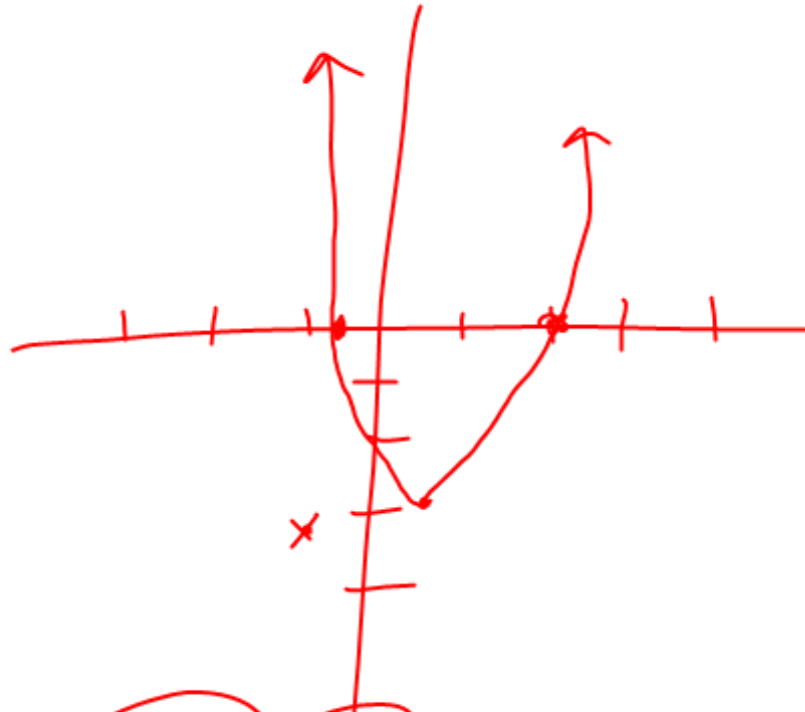
$$2x + 1 = 0$$

$$x = -\frac{1}{2}$$

$$9 + 16 = 25$$

$$x - 2 = 0$$

$$x = 2$$



# Zero Factor Property

Let  $a$  and  $b$  be real numbers.

If  $ab = 0$ , then  $a = 0$  or  $b = 0$ .

1. Factoring
2. Extracting Square Roots
3. Completing the Square
4. Using the Quadratic Formula

A **quadratic equation in  $x$**  is one that can be written in the form  $ax^2 + bx + c = 0$ , where  $a$ ,  $b$ , and  $c$  are real numbers with  $a \neq 0$ .

To solve  $x^2 + bx = c$  by completing the square, add  $(b/2)^2$  to both sides of the equation and factor the left side of the new equation.

The solutions of the quadratic equation  $ax^2 + bx + c = 0$ , where  $a \neq 0$ , are given by the **quadratic formula**

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

Solve the equation  $2x^2 + 3x - 5 = 0$ .

For applications, round to a value that is reasonable for the context of the problem. For all others round to ~~two~~<sup>3</sup> decimal places unless directed otherwise.

Solve the equation  $|2x - 1| = 6$ .

#51

$$(1998, 5.9) \quad (1999, 6.3)$$

$$\frac{6.3 - 5.9}{1} = .4$$

$$y - 5.9 = .4(x - 1998)$$

#14 General

$$\uparrow$$

$$(-3, -8) \quad (4, -1)$$

$$m = \frac{-1 + 8}{4 + 3} = \frac{7}{7} = 1$$

$$y + 1 = 1(x - 4)$$

$$y + 1 = x - 4$$

$$-x + y + 5 = 0$$

## 5 MINUTE CHECK

1. What is the slope of the line  $2x - 3y = 8$
2. What is the equation of the horizontal line passing through  $(-2, 4)$
3. What is the slope of the line perpendicular to  $3x + 5y = 10$
4. Write an equation of a line passing through  $(0, -3)$  with slope  $1/2$ .