

Rate of Change

Slope

$$\frac{y_2 - y_1}{x_2 - x_1}$$

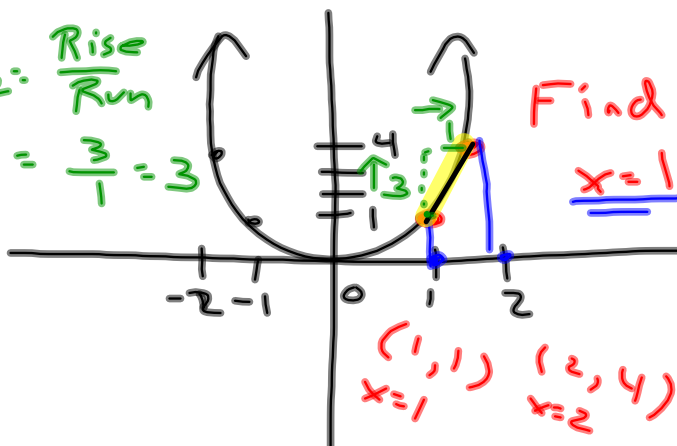


$$y = m x + b$$

↑
Slope

Find slope : 2 points (x, y) and (x, y)

Slope: $\frac{\text{Rise}}{\text{Run}}$
 $= \frac{3}{1} = 3$



Find slope between

$x=1$ and $x=2$

$(1, 1)$ and $(2, 4)$

$$\frac{4-1}{2-1} = \frac{3}{1} = 3$$

Slope (5, 8) (2, 3)

$$\begin{array}{r} \overset{+}{5} \quad \overset{+}{8} \\ - \quad \overset{-}{2} \quad \overset{-}{3} \\ \hline 3 \quad 5 \end{array}$$

$$\begin{array}{r} 3^2 \quad 5^2 \\ 9 \quad 25 \\ \hline 9 + 25 \\ \sqrt{34} \text{ distance} \end{array}$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 3}{5 - 2} = \frac{5}{3}$$

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Slope y/x
 Rate of change
 $\frac{5}{3}$

Steps

① Graph

② Rate of Change

"think"

$-1 \leq x \leq 0$

Shade
color
High light

$y = 2x^2 - 1$

$a = 2$
 $b = 0$
 $c = -1$

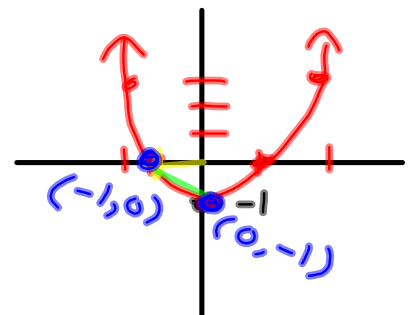
$\frac{0}{2(2)} = \frac{0}{4} = 0$

$y = 2(0)^2 - 1$
 $y = 0 - 1$
 $y = -1$

$(0, -1)$ vertex

$x = 0$ AOS

max / min



open: 

$$y = 2x^2 - 1$$

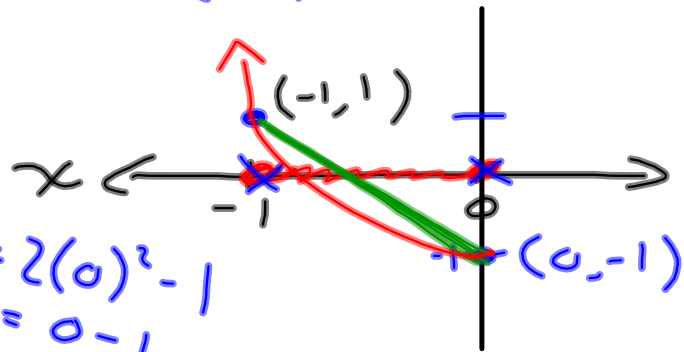
$$\begin{aligned} y &= 2(-1)^2 - 1 \\ &= 2(1) - 1 \\ &= 2 - 1 \\ &= 1 \\ &(-1, 1) \end{aligned}$$

know

$$\textcircled{-1} \leq x \leq 0$$

$$x = -1$$

$$\begin{aligned} y &= 2(0)^2 - 1 \\ &= 0 - 1 \\ &= -1 \end{aligned}$$



$$\text{Slope} = \frac{-1 - 1}{0 - (-1)}$$

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

Rate of Change

$$y = x^2 + 3x - 2$$

$$x = \boxed{1} \leq x \leq \boxed{2}$$

Graph

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

$$\frac{-3}{2(1)} = \left(\frac{3}{2}, y \right)$$

Use Inequality

* $x = 1$ $x = 2$
 $(1,)$ $(2,)$

