September 9, 2010

Note Title 9/9/2010

§2.2 #28

$$y = \sqrt[3]{x-8}$$

y-intercepts: $x = 0$

$$y = \sqrt[3]{0-8}$$

$$= \sqrt[3]{-8} \qquad (-2)(-2)(-2) = -8$$

$$y = -2 \qquad (0, -2) \text{ y-intercept.}$$

x-intercept: $y = 0$

$$0 = \sqrt[3]{x-8}$$

$$0^3 = \left[(x-8)^{1/3}\right]^3$$

$$0 = x - 8 \qquad (8, 0)$$

$$8 = x$$

#32 $x^2 - y^2 = 9$

Wrong!

$x^2 - y^2 = 9$

y-intercept: $x = 0$

$x - y = \pm 3$ No!!

$x^2 - y^2 = 9$

$0 - y^2 = 9$

$y^2 = -9$

$y = \pm\sqrt{3}\,i$ imaginary number

NO y-intercept

x-intercepts: $y = 0$

$x^2 - y^2 = 9$

$x^2 - 0 = 9$

$x^2 = 9$ $(-3,0)$ & $(3,0)$

$x = \pm 3$

§2.3 LINES

$2x - y = -2$

x-intercept: $y = 0$

$2x - 0 = -2$

$x = -1$ $\quad (-1, 0)$

y-intercept: $x = 0$

$2(0) - y = -2$

$-y = -2$

$y = 2$ $\quad (0, 2)$

Example

$2x + 4y = 10$

x-intercept: $y = 0$

$2x + 4(0) = 10$

$2x = 10$

$x = 5$ $(5, 0)$ is the x-intercept.

y-intercept: $x = 0$

$2(0) + 4y = 10$

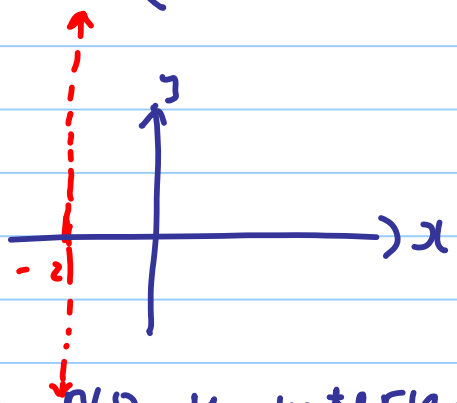
$4y = 10$

$y = \frac{5}{2}$

$\left(0, \frac{5}{2}\right)$ is the y-intercept

Example

$x = -2$

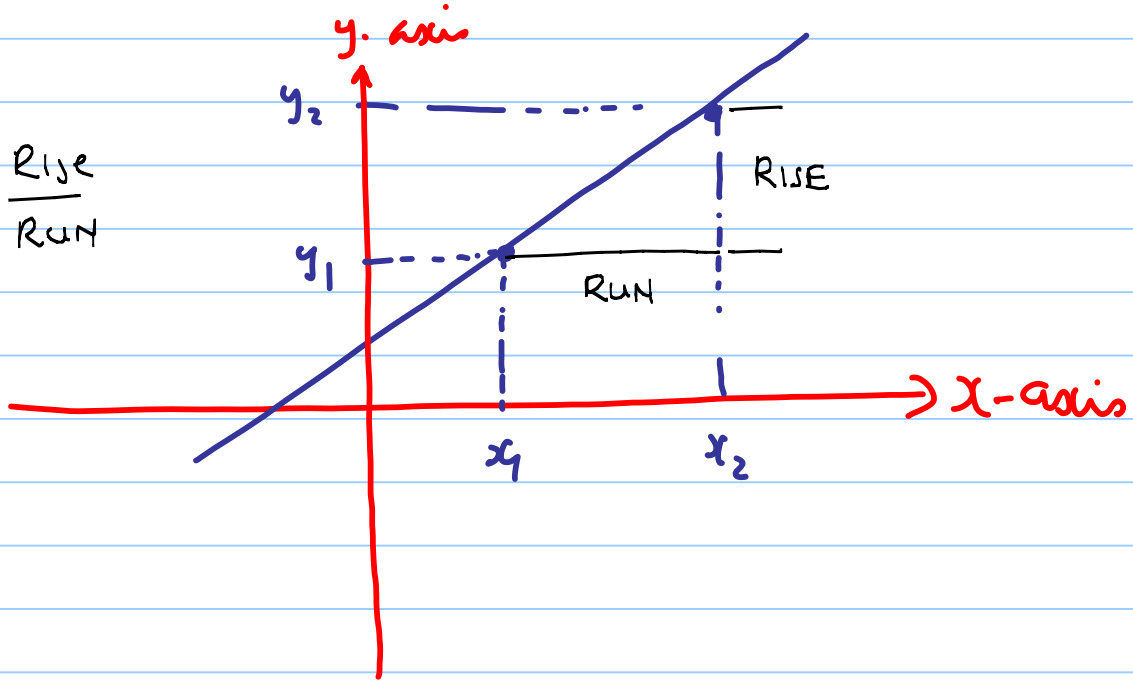


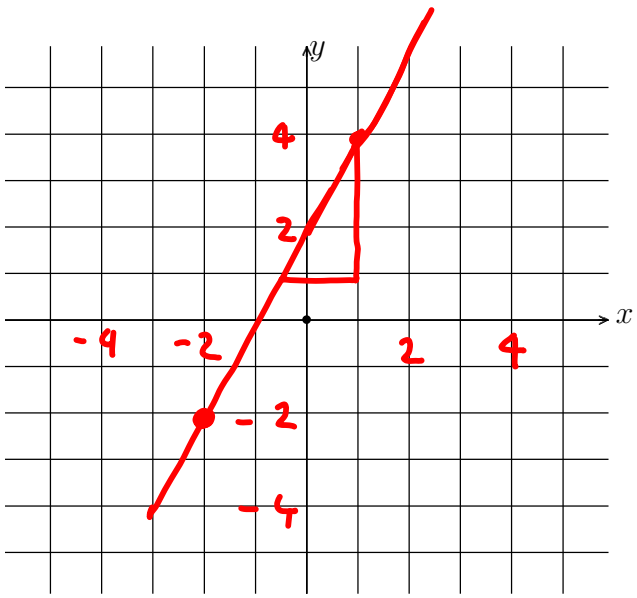
x can never be zero so no y-intercept.

vertical line:

$(-2, 0)$ is the x-intercept.

Slope $m = \frac{\text{Rise}}{\text{Run}}$





Example

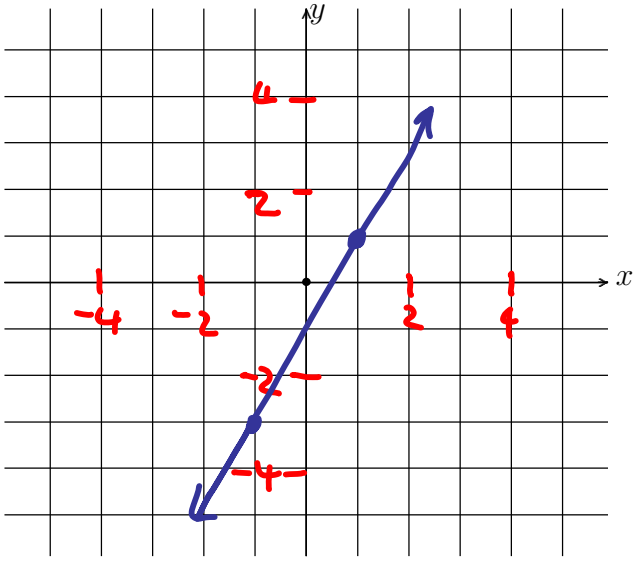
$(x_1, y_1) = (-2, -2)$

$(x_2, y_2) = (1, 4)$

Slope $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

$= \dfrac{4 - (-2)}{1 - (-2)}$

$= \dfrac{4+2}{1+2} = \dfrac{6}{3} = 2$

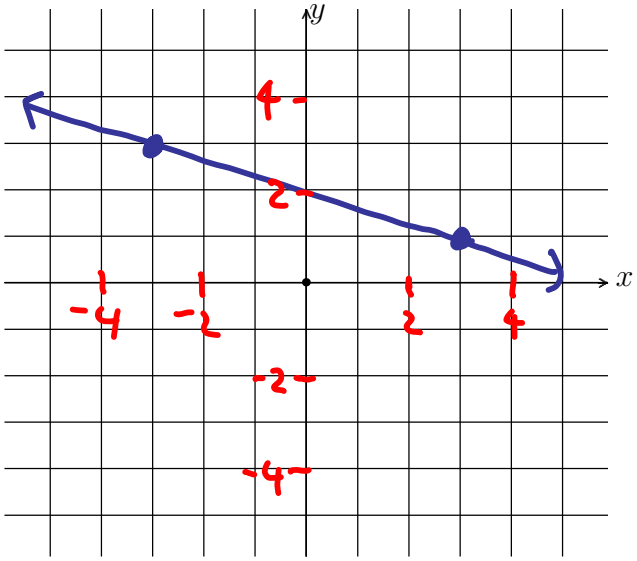


$(-1, -3)$ & $(1, 1)$

Line is rising

Slope $m = \dfrac{1 - (-3)}{1 - (-1)}$

$= \dfrac{4}{2} = 2$

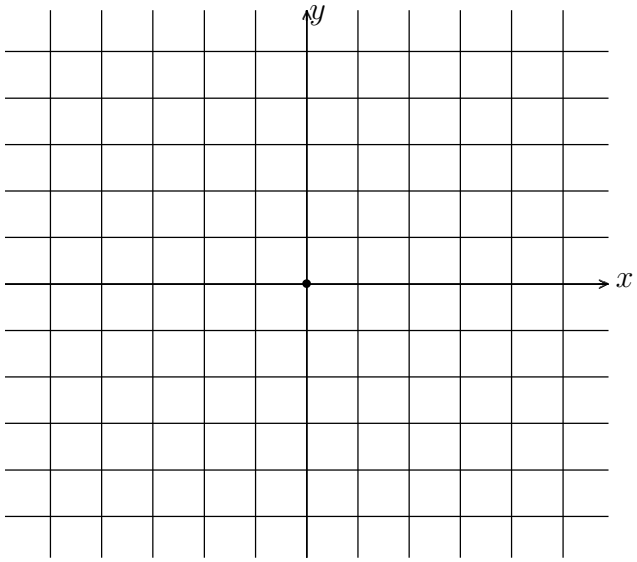


$(-3, 3)$ & $(3, 1)$

Falling line

Slope $m = \dfrac{1-3}{3-(-3)} = \dfrac{-2}{6}$

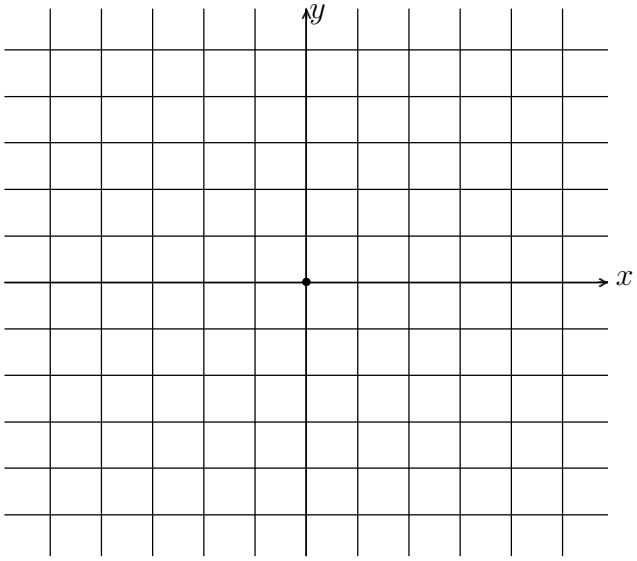
$= -1/3$



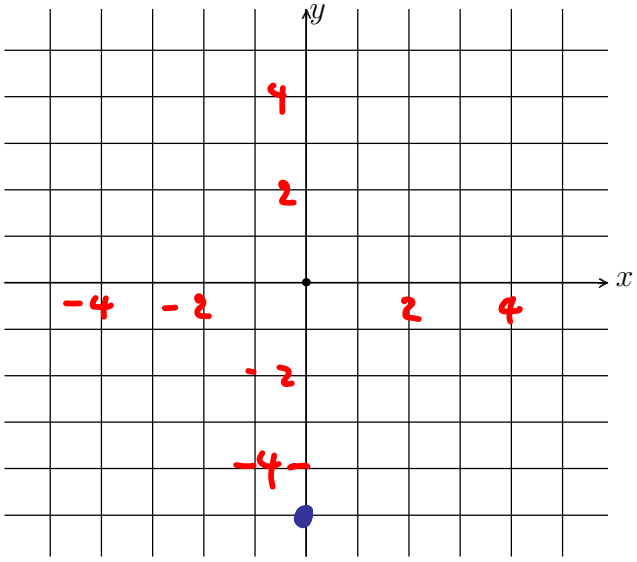
$(-1, -2)$ & $(3, -2)$

Horizontal line

Slope $m = 0$



$(1, -4)$ & $(1, 3)$



$2x - 3y = 15$

$-3y = -2x + 15$

$$\boxed{y = \frac{2}{3}x - 5}$$

Slope intercept form.

$m = \frac{2}{3}$

y intercept: $(0, -5)$