

## 1.1 Coordinate Systems and Graphs

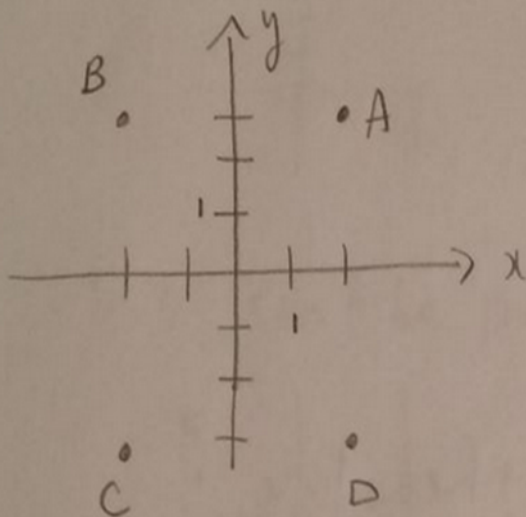
Ex: plot the points

$$A = (2, 3)$$

$$B = (-2, 3)$$

$$C = (-2, -3)$$

$$D = (2, -3)$$



Ex: Consider the line  $21x + 7y = 14$

a) Put into standard form  $y = mx + b$

$$7y = -21x + 14$$

$$y = -3x + 2$$

b) Slope?

$$m = -3$$

c) y-intercept?

$$b = 2$$

d) x-intercept?

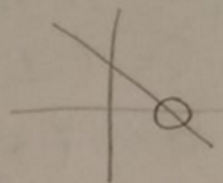
Set  $y = 0$  and solve for  $x$

$$y = -3x + 2$$

$$0 = -3x + 2$$

$$-2 = -3x$$

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



e) is  $(1, -1)$  on the line?

$$\begin{aligned} \text{Sub } x &= 1 \\ y &= -1 \end{aligned}$$

Is  $y = -3x + 2$  true?

Yes

f) is  $(2, 1)$  on the line?

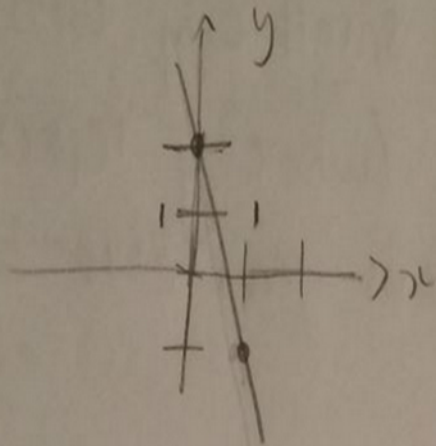
$$\begin{aligned} \text{Sub } x &= 2 \\ y &= 1 \end{aligned}$$

Is  $y = -3x + 2$  true?

No

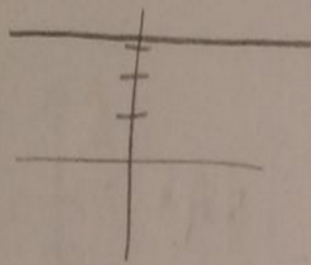
False

g) Plot the line



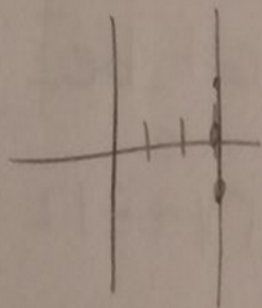
Ex:  $y=3$  has  $m=0$   $b=3$

Ex:



HORIZONTAL

Ex:  $x=3$  can't be put in the form  $y=mx+b$



VERTICAL

| $x$ | $y$ |
|-----|-----|
| 3   | -1  |
| 3   | 0   |
| 3   | 1   |

Ex: Annual car insurance for a 2010 Honda Civic in a small city costs  
 $y = 65x + 712$  (where  $y$  represents dollars and  $x$  represents years after 2010).

a) cost in 2015?

$$x = 2015 - 2010 = 5$$

$$\rightarrow y = 65x + 712$$

$$y = 65(5) + 712$$

$$= \$1037$$

b) in which year will cost be \$1167?

$$y = 1167 \rightarrow y = 65x + 712$$

$$1167 = 65x + 712$$

$$455 = 65x$$

$$7 = x \leftarrow \text{years after 2010}$$

2017

c) interpret the y-intercept  
(y-value when  $x=0$ )

The cost in 2010 is \$712