Starter 30 OCT 2018

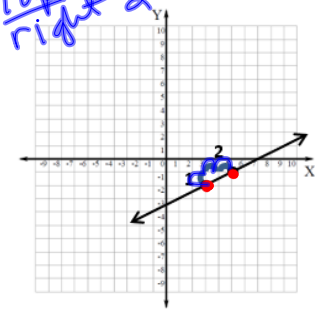
Answer in complete sentences.

1) Explain what the slope of a line represents.

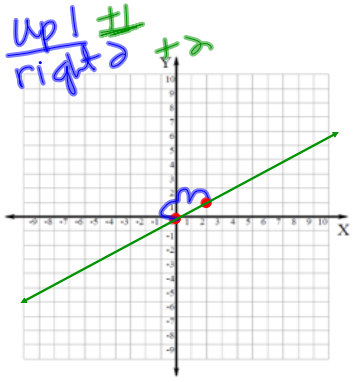
2) Explain what x_1 and x_2 mean.

1) $(3,-2);\frac{1}{2}$

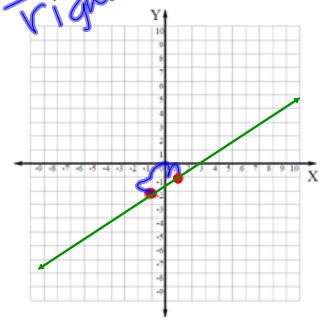
Step 1: Plot the point
Step 2: Count the slope From the point (1 ↑ , 2 →)
Step 3: Put another point at the spot.
Step 4: Draw the line.



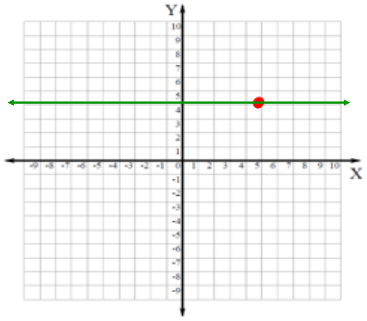
2) $(0,0);\frac{1}{2}$



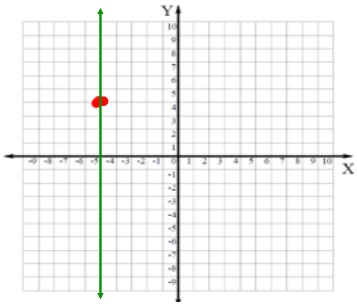
3) $(-1,-2);\frac{1}{2}$



4) $(5,4);0$ slope → horizontal



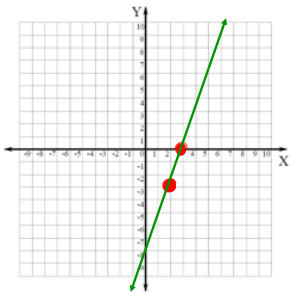
6) $(-5,4)$; *undefined* slope → Vertical



5) $(2,-3);3$ $m = \frac{3}{1}$

$+1 \quad +3$

$(3,0)$



or graph

Writing an equation of a line

To write an equation of a line, one must have a slope and a point.

There are many forms of a line, but in this class we will consider only 3 of those.

My-favorite: **Point slope** $y - y_1 = m(x - x_1)$

Slope y-intercept $y = mx + b$

$(x_2-x_1)m = \frac{y_2-y_1}{x_2-x_1}(x_2-x_1)$

$m(x_2-x_1) = y_2-y_1$

$y-y_1 = m(x-x_1)$

Write the equation of the line with the given information.

I do: $y-y_1 = m(x-x_1)$ $(4,7)$ $m=\frac{2}{3}$

Step 1 : Substitute into point slope form

Step 2: Distribute — clear fraction $y-7=\frac{2}{3}(x-4)$

Step 3: Move constant

Step 4: Add like terms

Now the linear equation is in $y=mx+b$ form.

$m=\frac{2}{3}$ $b=\frac{13}{3}$

$y=\frac{2}{3}x+\frac{13}{3}$

crosses the y-axis.

3. $y-7=\frac{2}{3}(x-4)\cdot 3$

$3y-21=2x-8$

$+21 \quad +21$

$\frac{3y}{3}=\frac{2x+13}{3}$

$y=\frac{2}{3}x+\frac{13}{3}$

$-8+13$

We do: $y-y_1=m(x-x_1)$ $(-4,10)$ $m=\frac{-5}{6}$

Step 1 : Substitute into point slope form

Step 2: Distribute $y-10=\frac{-5}{6}(x+4)$

Step 3: Move constant

Step 4: Add like terms $y-10=\frac{-5}{6}(x+4)$

Now the linear equation is in $y=mx+b$ form.

$m=\frac{-5}{6}$ $b=\frac{20}{3}$

$y=-\frac{5}{6}x+\frac{20}{3}$

$6 \cdot \left(y - 10 = \frac{-5}{6}(x+4)\right) \cdot 6$

$6y - 60 = -5x - 20$

$+60 \quad +60$

$\frac{6y}{6} = \frac{-5x}{6} + \frac{40}{6}$

$y = -\frac{5}{6}x + \frac{20}{3}$

You do: $y - y_1 = m(x - x_1)$ $(-1,8)$ $m = \frac{2}{5}$

$-(-1)$

Step 1 : Substitute into point slope form $y - 8 = \frac{2}{5}(x+1)$

Step 2: Distribute

Step 3: Move constant

Step 4: Add like terms

Now the linear equation is in $y = mx + b$ form.

$m =$ _____ $b =$ _____

$5 \cdot \left(y - 8 = \frac{2}{5}(x+1)\right) \cdot 5$

$5y - 40 = 2x + 2$

$+40 \quad +40$

$\frac{5y}{5} = \frac{2x}{5} + \frac{42}{5}$

$y = \frac{2}{5}x + \frac{42}{5}$

We do: the line passing through $(-3,6)$ and $(8,-10)$

**What do we need??

slope

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

Now we are back to the above.

Step 1 : Substitute into point slope form

Step 2: Distribute

Step 3: Move constant

Step 4: Add like terms

Now the linear equation is in $y = mx + b$ form.

$m =$ _____ $b =$ _____

$y - 6 = \frac{-16}{11}(x - (-3))$

$y - y_1 = m(x - x_1)$

1, 2, 3