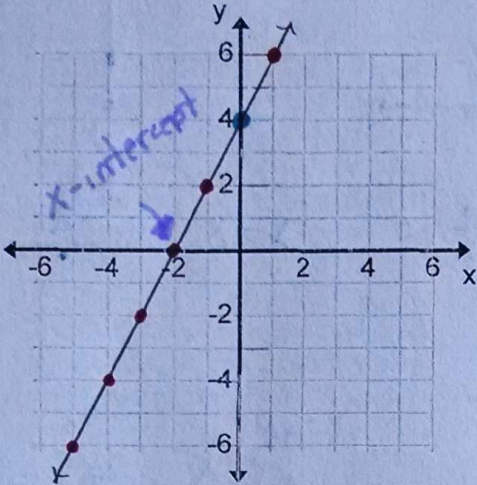


Notes Verbal Descriptions and Applications

- 1) A linear function f models a relationship in which the **dependent variable decreases 6 units for every 3 units the independent variable decreases**. The value of the function at 0 is 4. Graph the function. Identify the slope, y -intercept and x -intercept on the graph. $\uparrow x=0, y=4$



slope: $\frac{\Delta y}{\Delta x} = \frac{-6}{-3} = \frac{2}{1} \uparrow$

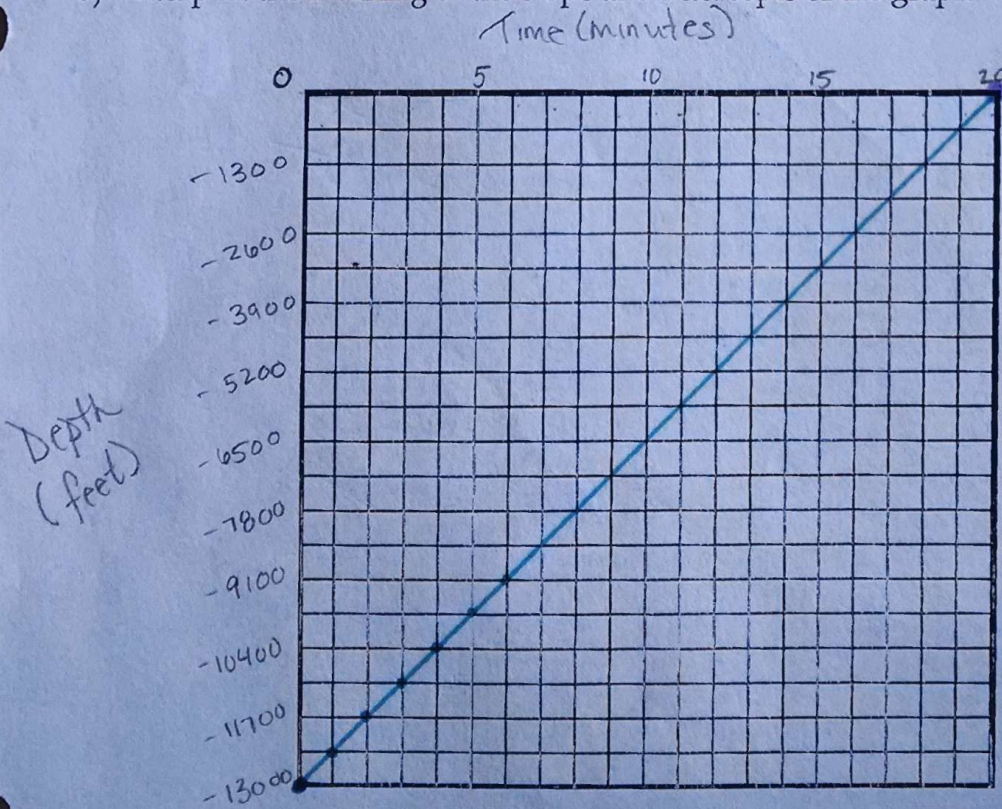
y -intercept: $(0, 4)$

x -intercept: $(-2, 0)$

equation of the Line: $y = 2x + 4$

- 2) A submersible that is exploring the ocean floor begins to ascend to the surface. The elevation h (in feet) of the submersible is modeled by the function $h(t) = 650t - 13,000$, where t is the time (in minutes) since the submersible began to ascend.

- a) Graph the function and identify its domain and range.
 b) Interpret the meaning of the slope and intercepts of the graph.



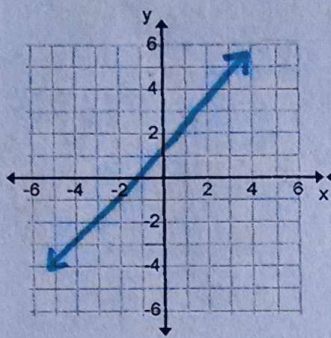
slope: $\frac{650 \text{ft}}{1 \text{min}}$
 ascending 650ft every minute

y-intercept $(0, -13,000)$
 starting depth

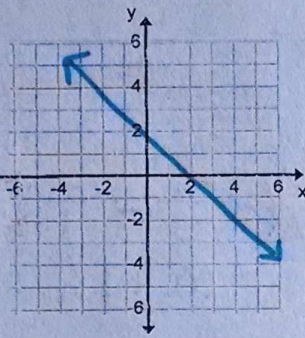
x-intercept $(20, 0)$ ★
 took 20 minutes for submarine to reach the surface

Types of Slope

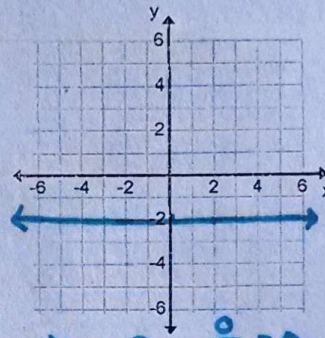
Positive Slope



Negative Slope



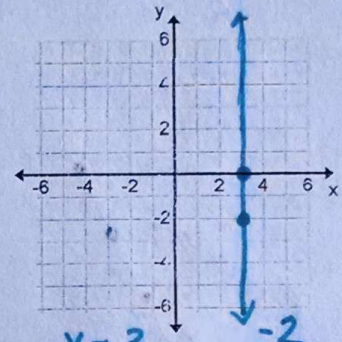
Slope of 0



$$y = -2 \quad \frac{0}{2} = 0$$

$$y = \cancel{0} - 2$$

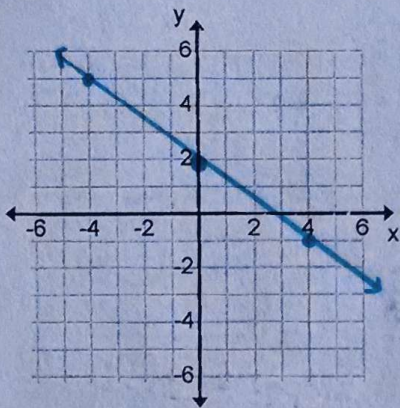
Undefined Slope



$$x = 3 \quad \frac{-2}{0}$$

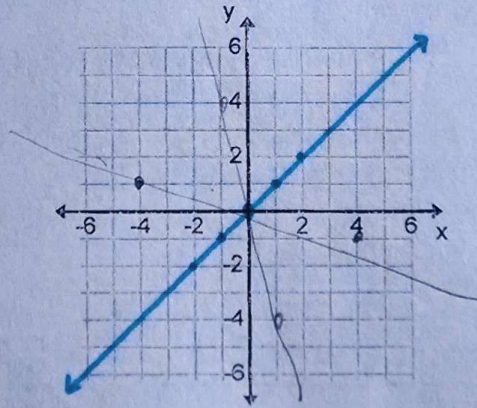
Graph the following lines.

$$y = -\frac{3}{4}x + 2 \quad \frac{-3}{4}$$



$$y = x \quad m = 1$$

$$b = 0$$

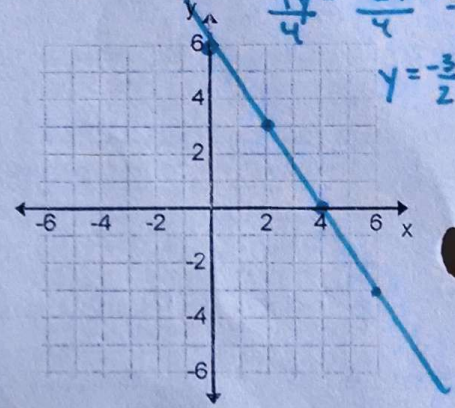


$$6x + 4y = 24$$

$$-6x \quad -6x$$

$$\frac{4y}{4} = \frac{-6x + 24}{4}$$

$$y = -\frac{3}{2}x + 6$$



Find the slope.

1) 1

| | | | | |
|---|----|----|----|----|
| x | 1 | 2 | 3 | 4 |
| y | -2 | -2 | -2 | -2 |

$\frac{0}{1} = 0$

2)

| | | | | |
|---|----|----|-----|-----|
| x | -4 | -1 | 3 | 5 |
| y | 15 | 3 | -13 | -21 |

$\frac{\Delta y}{\Delta x} = \frac{-12}{3} = \frac{-16}{4} = \frac{-8}{2} = -4$

3) $(-2, 3)$ and $(-2, 5)$

$$\frac{5-3}{-2-(-2)} = \frac{2}{0} \text{ Undefined}$$

4) $(3, -5)$ and $(-3, 5)$

$$\frac{5-(-5)}{-3-3} = \frac{10}{-6} = -\frac{5}{3}$$

5) $10x - 15y = 45$

$$-15y = -10x + 45$$

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

6) Write the equation of the line in slope - intercept form with a slope of $\frac{1}{3}$ and a y - intercept of -1 .

$$y = \frac{1}{3}x - 1$$