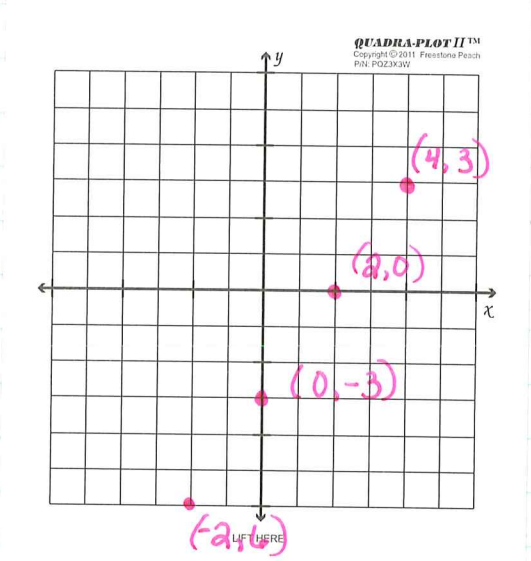
6.3 Linear Functions p. 258

A **Linear Function** is a function whose graph is a **nonvertical line**. A linear function can be written in the form $y = mx + b$, where m is the slope and y is the y-intercept.

① Use the graph to write a linear function that relates y to x.



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

② Use the ratio table to write a linear function that relates y to x.

X	-3	-2	-1	0
Y	9	7	5	3

- choose 2 points to find the slope (m) $\quad \frac{5-3}{-1-0} = \frac{2}{-1} = -2$
- The y-intercept is 3 (because x is 0)
- $y = -2x + 3$

How do you find the y-intercept if there is no 0 for an x-value in a table?

(A)

x	1	2	3	4
y	9	18	27	36

① Find the slope (m) $\frac{18-9}{2-1} = \frac{9}{1} = \boxed{9}$

② replace x and y w/ any ordered pair to find b
- I'll use (2,18) and solve for b

$18 = 9(2) + b$
$18 = 18 + b$
$-18 \quad -18$
$0 = b$

- so it's a proportional relationship since it goes through the origin $\boxed{y = 9x}$

(B)

x	6	3	-3	-6
y	10	6	-2	-6

① $m = \frac{10-6}{6-3} = \frac{4}{3}$

② (3,6) $6 = \frac{4}{3}(3) + b$

$6 = 4 + b$
$2 = b$

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