$x = \#$ vertical line $+$
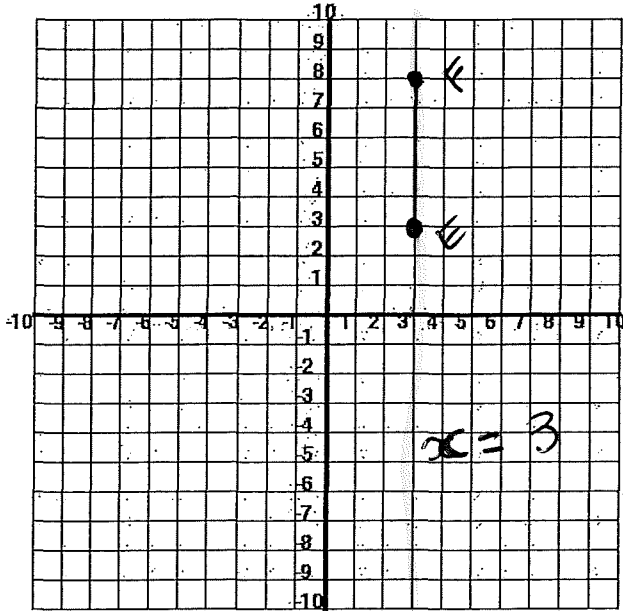
$y = \#$ horizontal line $\underline{}$ Date: _____

5.5: Slopes of Special Lines and Equations of Lines

1. Graph the following points and calculate the slope.
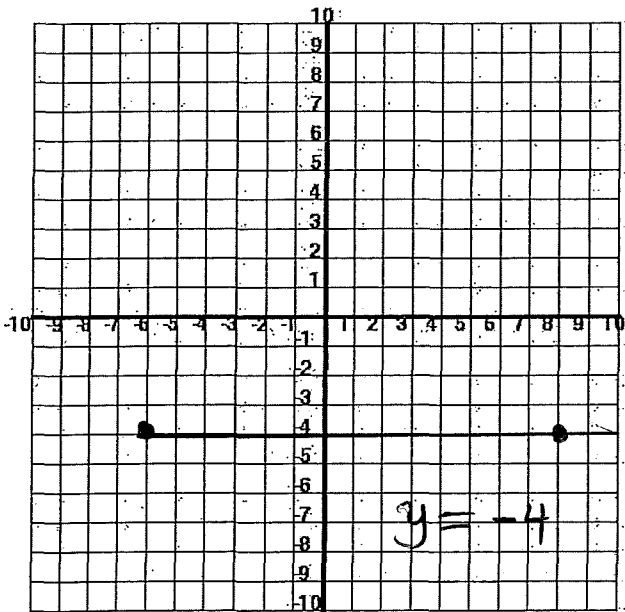
a) E(3, 3) F(3, 8)

On graph: $x = 3$

slope of a vertical line
is UNDEFINED.

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

$= \dfrac{8 - 3}{3 - 3} = \dfrac{5}{0}$ undefined

(can not divide by 0)

b) G(-6, -4) H(8, -4)

On graph: $y = -4$

Slope of a horizontal line
is 0.

$m = \dfrac{-4 + 4}{8 + 6} = \dfrac{0}{14} = 0$

c) A(-5, 6) B(-5, -2)

$m = \dfrac{-2 - 6}{-5 + 5} = \dfrac{-8}{0}$

undefined

d) C(5, -3) D(-4, -3)

$m = \dfrac{-3 + 3}{-4 - 5}$

$= \dfrac{0}{-9} = 0$

Equation of a line

$y = mx + b$ ___ is the equation of a line in __Slope y-intercept__ form.

"m" represents __Slope__.

"b" represents __y-intercept__ (where the line crosses the y-axis).
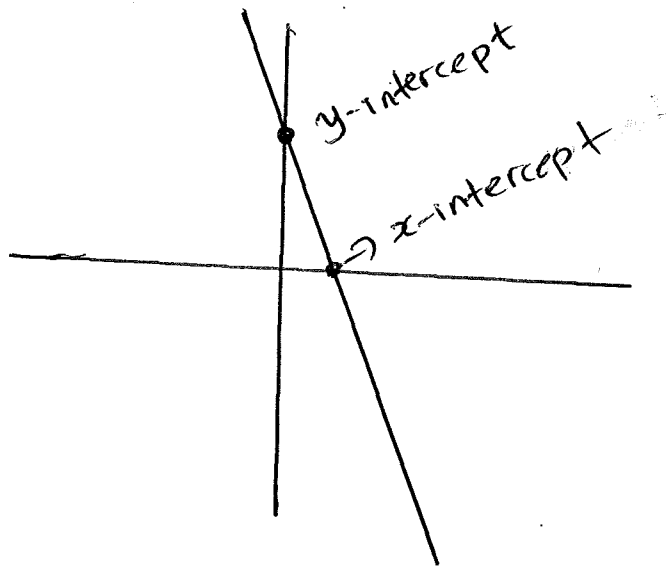
How do you find *m* and *b*?

1) b is __the y-coordinate where the line crosses the y-axis.__

2) Calculate slope using __$\dfrac{rise}{run}$ or $\dfrac{y_2 - y_1}{x_2 - x_1}$__

3) Once you have the two components, __we can write the equation $y = mx + b$.__

4) x-intercept is where the line crosses the __x-axis.__. To find this, we set

__$y = 0$__, find the spot on the graph where the line passes through the __x-axis.__.

y-intercept
x-intercept

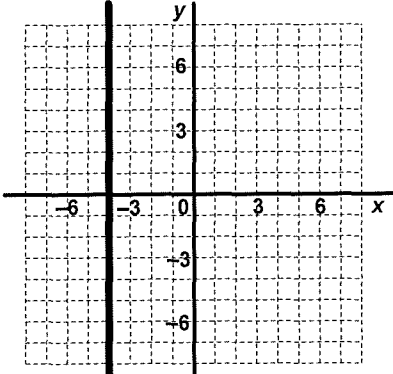## Interpreting the Slope Y-Intercept Form of a Line

Fill in the chart below:
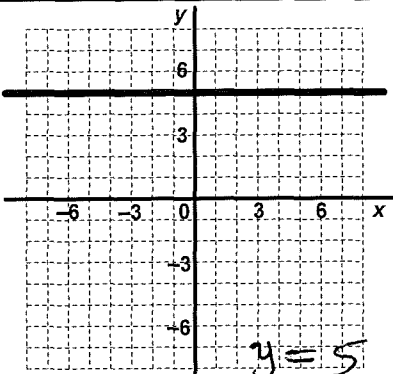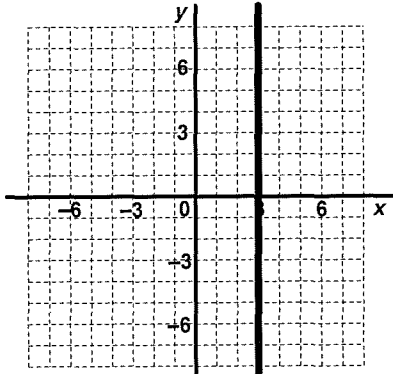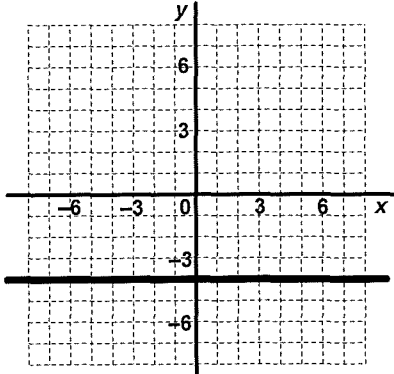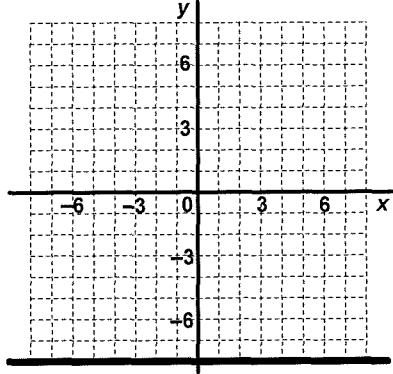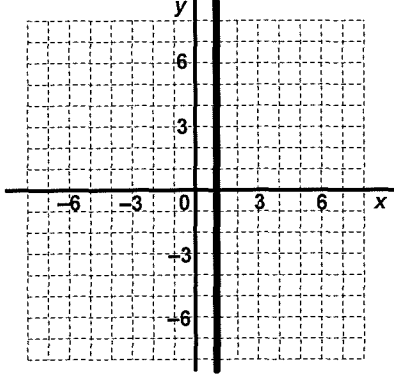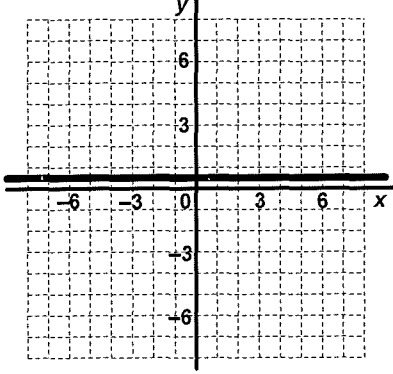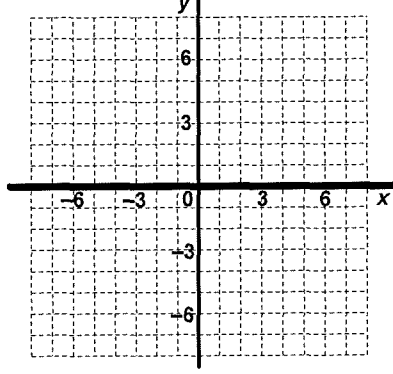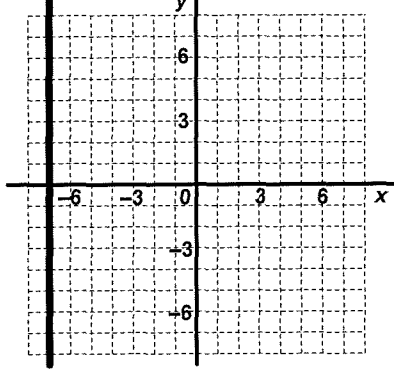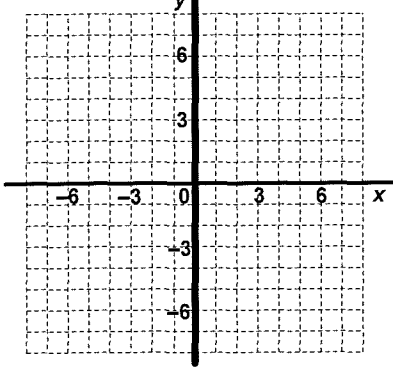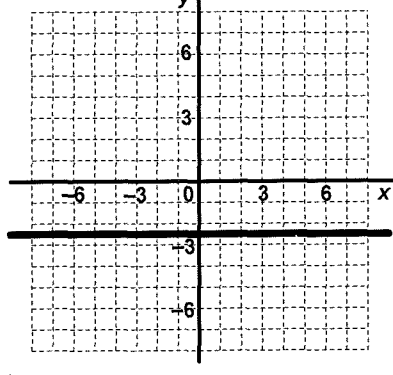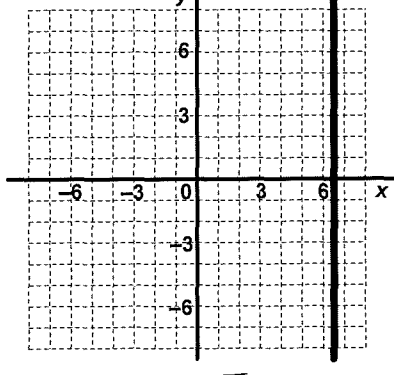
$$y = \overset{\text{slope}}{m}x + \overset{\substack{\text{y-intercept}\\ \text{(with its sign!)}}}{b}$$

	EQUATION	SLOPE	Y-INTERCEPT	DIRECTION
1.	$y = 6x + 13$	6	13	up
2.	$y = -4x + 9$	-4	9	down.
3.	$y = -7x - 5$	-7	-5	down
4.	$y = x - 2$	1	-2	up
5.	$y = \frac{3}{2}x + 10$	3/2	10	up.
6.	$y = \frac{4}{5}x - 7$	4/5	-7	up.
7.	$y = -x + \frac{9}{4}$	-1	9/4	down
8.	$y = 8.3x$	8.3	0	up.
9.	$y = \frac{5x}{11} - 3.7$	$\frac{5}{11}$	-3.7	up.
10.	$y = 11$ $y = 0x + 11$	0	11	horizontal
11.	$y = 6 - \frac{x}{7}$	-1/7	6	down.
12.	$y = -8 + \frac{2x}{3}$	$\frac{2}{3}$	-8	up.

3

Special Graphs Are Easy!

1. $y = 5$

2. $x = 3$

3. $y = -4$

4. $x = -4$

5. $y = -8$

6. $x = 1$

7. $y = 0.5$

8. $y = 0$

9. $x = -7$

10. $x = 0$

11. $y = -2.5$

12. $x = 6.5$