

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Writing Equations of Lines:  $y = mx + b$**

**Writing an equation of a line given  $m$  and  $b$ .**

- A. Substitute slope for  $m$  and  $y$ -intercept for  $b$ .
- B. Simplify the equation.

1. Slope is  $-5$  and  $y$ -intercept is  $3$ .

$$y = -5x + 3$$

2. Slope is  $-1/2$  and  $y$ -intercept is  $-3$ .

$$y = -\frac{1}{2}x - 3$$

3. Slope is  $0$  and  $y$ -intercept is  $1$ .

$$y = 0x + 1$$

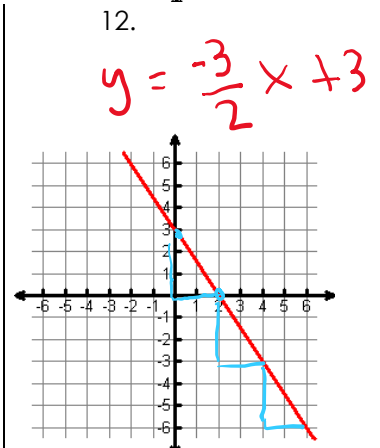
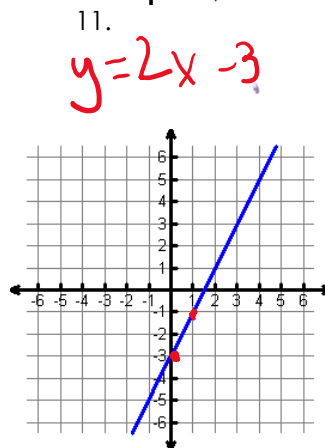
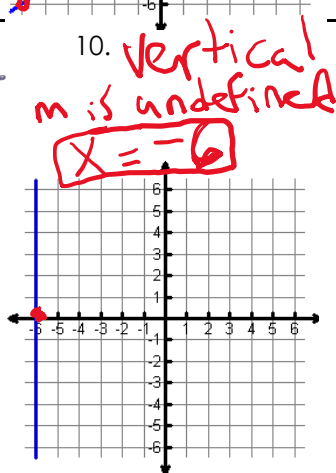
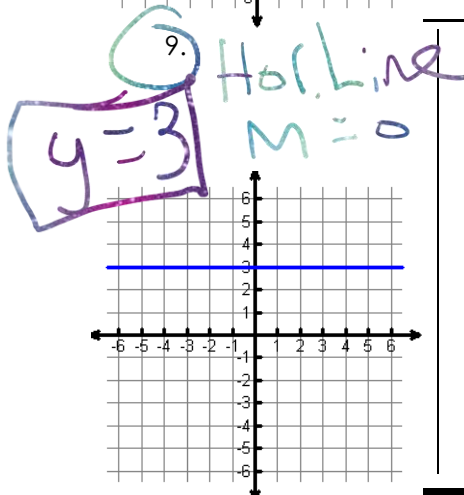
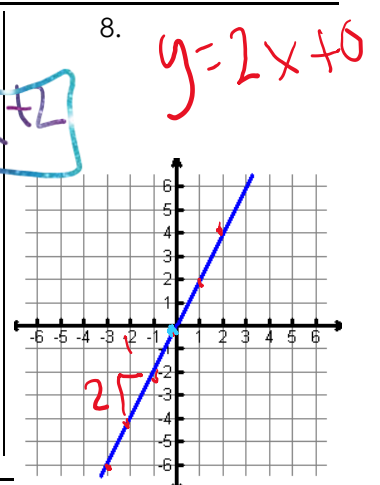
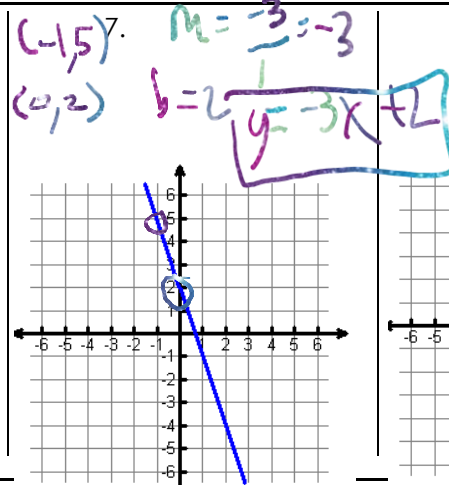
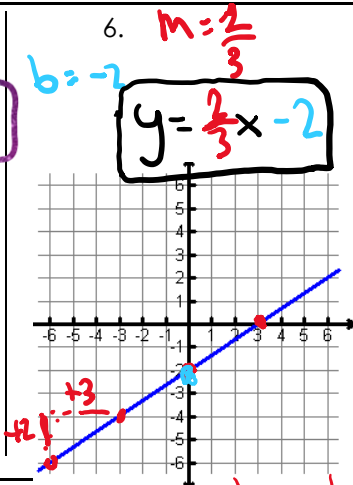
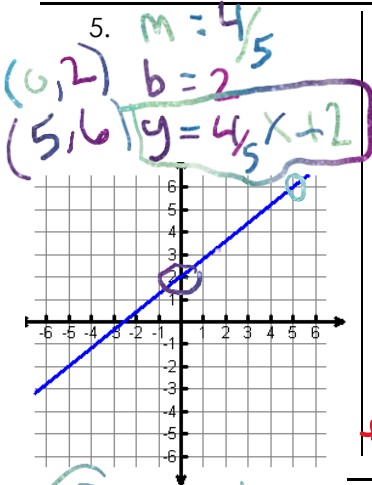
$$y = 1$$

4. Slope is  $1/3$  and  $y$ -intercept is  $8$ .

$$y = \frac{1}{3}x + 8$$

**Writing an equation of a line given a graph.**

- ✓ A. Use any 2 "good" points on the graph to find the slope,  $m$ .
- ✓ B. Find the  $y$ -intercept on the graph,  $b$ .
- ✓ C. Substitute slope for  $m$  and  $y$ -intercept for  $b$  into the equation  $y = mx + b$ .



**Writing an equation of a line given m and a point.**

- A. Substitute slope for m and the point (x, y) into  $y=mx+b$  and solve for b.
- B. Substitute m and b back into the equation.

13.  $m = 2$  and Point: (4, 7)

$$y = 2x + b$$

$$7 = 2(4) + b$$

$$7 = 8 + b$$

$$-8 \quad -8$$

$$-1 = b$$

$$y = 2x - 1$$

14.  $m = 1/2$  and Point: (2, -3)

$$-3 = \frac{1}{2}(2) + b$$

$$-3 = 1 + b$$

$$-4 = b$$

$$y = \frac{1}{2}x - 4$$

15.  $m = -2$  and Point: (-7, 1)

$$y = -2x - 13$$

16.  $m = 4$  and Point (1, 4)

$$y = 4x$$

17.  $m = 1/2$  and Point: (-1, -2)

$$y = \frac{1}{2}x - \frac{3}{2}$$

18.  $m = 2$  and Point (0, 3)

$$y = 2x + 3$$

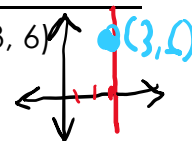
19.  $m = 3$  and Point: (3, 0)

$$y = 3x - 9$$

20.  $m = \text{undefined}$  and Point (3, 6)

$$x = 3$$

vertical line



**Writing an equation of a line given TWO points.**

- A. Use the slope formula to find m.
- B. Pick one point, substitute slope for m, the point (x, y) and then solve for b.
- C. Substitute m and b back into the equation.

21. (2, 3) and (5, 0)

$$m = \frac{-3}{3} = -1$$

$$y = -1x + 5$$

$$2 = -1(2) + b$$

$$2 = -2 + b$$

$$+3 \quad +3$$

$$5 = b$$

22. (1, 5) and (-4, 15)

$$m = \frac{10}{-5} = -2$$

$$y = -2x + 7$$

23. (2, 2) and (0, 4)

$$m = \frac{2-4}{2-0} = \frac{-2}{2} = -1$$

$$y = mx + b$$

$$2 = -1(2) + b$$

$$2 = -2 + b$$

$$+2 \quad +2$$

$$4 = b$$

$$y = -1x + 4$$

24. (2, 3) and (1, 4)

$$m = \frac{-1}{-1} = 1$$

$$y = -1x + 5$$

25. (4, 5) and (5, 2)

$$m = \frac{-3}{1} = -3$$

$$y = -3x + 17$$