

# 7.3 Linear Functions (Day 1)

Name \_\_\_\_\_

(positive slope)

Determine which equations have graphs that rise (going from left to right) and which have graphs that fall. Check your answers by graphing each equation on your calculator.

1.  $y = 3x$ ,  $y = \frac{1}{3}x$ ,  $y = -3x$   
pos. pos. neg.

2.  $y = -4x$ ,  $y = 2x$ ,  $y = -\frac{1}{4}x$   
neg. pos. neg.

3.  $y = -2x - 1$ ,  $y = -4x + 3$ ,  $y = 2x + 5$   
neg. neg. pos.

4.  $y = 3 - 2x$ ,  $y = -2x + 3$ ,  $y = 5 + 3x$   
neg. neg. pos.

Find the slope of the line through each pair of points.

5.  $(-1, 2)$  and  $(2, -6)$   
 $x_1 \ y_1 \ x_2 \ y_2$

6.  $(-3, 1)$  and  $(-1, -5)$   
 $x_1 \ y_1 \ x_2 \ y_2$

$$m = \frac{-6 - 2}{2 - (-1)} = \boxed{-\frac{8}{3}}$$

$$m = \frac{-5 - 1}{-1 - (-3)} = \frac{-6}{2} = \boxed{-3}$$

Determine the slope and y-intercept for each equation.

7.  $y = 2x - 4$   
 $m = 2$   
 $b = -4$

8.  $2x + 3y = 2$

Solve for y!  
 $m = -\frac{2}{3}$   
 $b = \frac{2}{3}$

$$\begin{aligned} 2x + 3y &= 2 \\ -2x & \quad -2x \\ \hline 3y &= -2x + 2 \\ \frac{3y}{3} &= \frac{-2x + 2}{3} \\ y &= -\frac{2}{3}x + \frac{2}{3} \end{aligned}$$

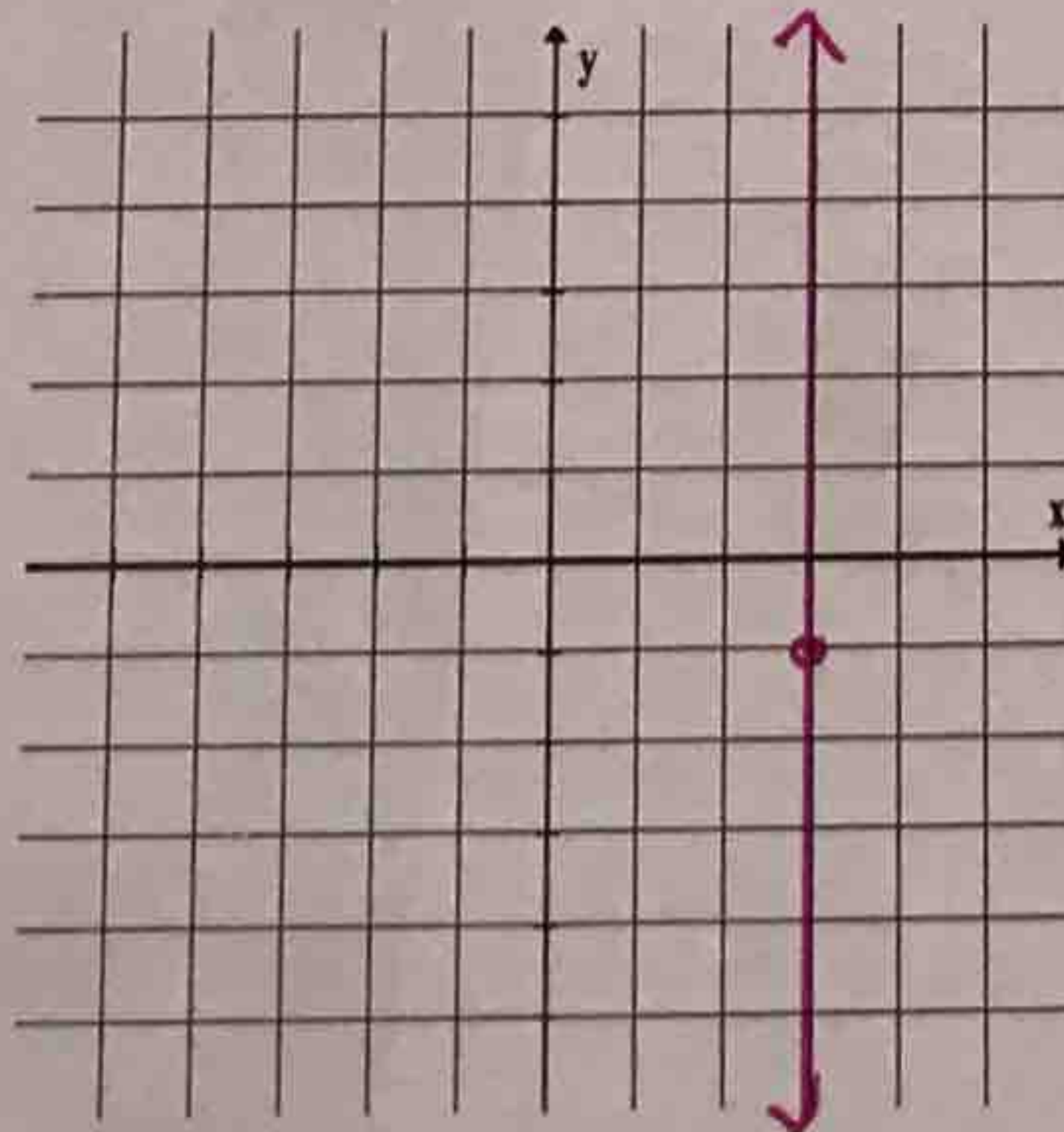
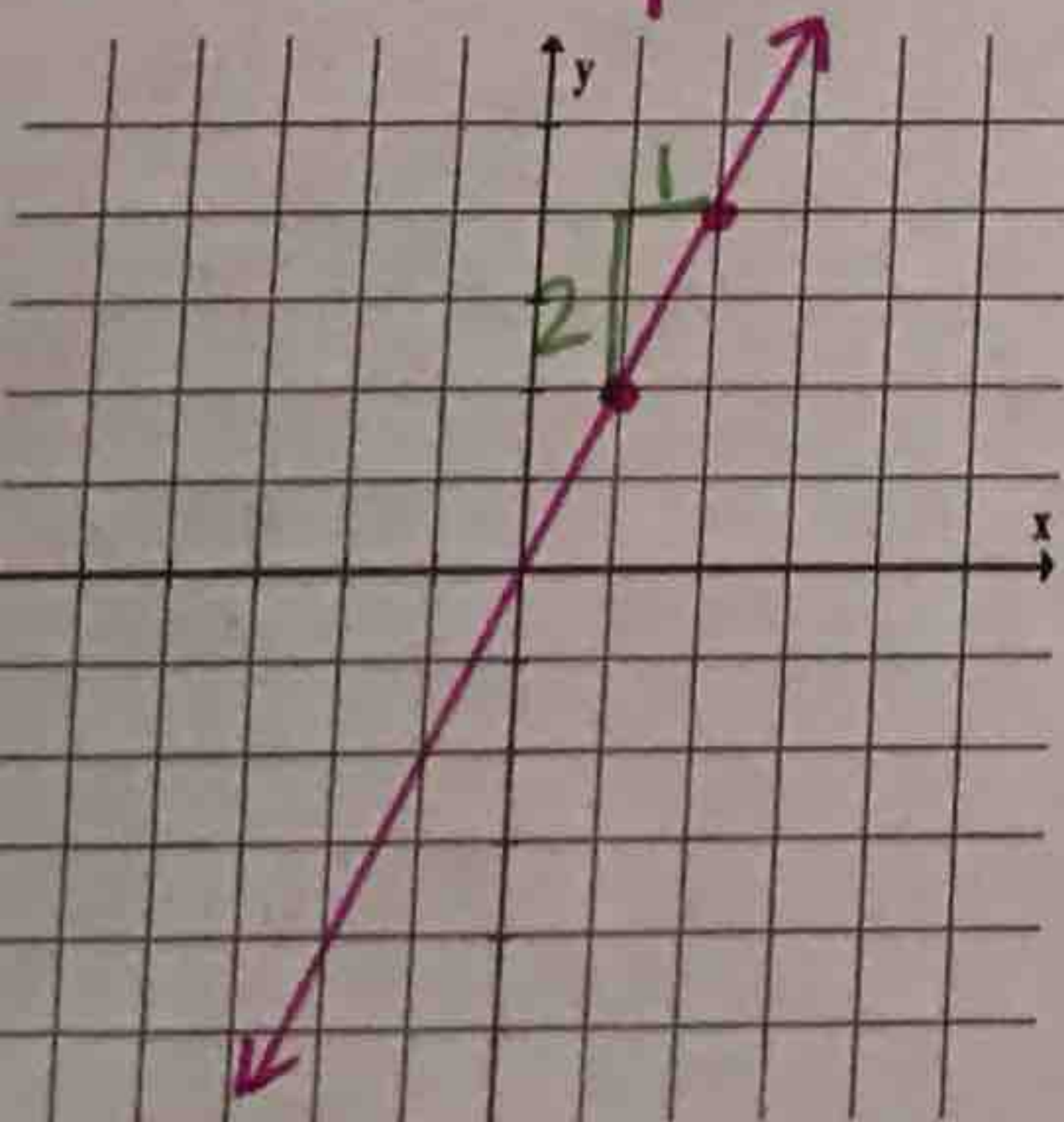
9.  $-x + 3y + 2 = 0$   
 $m = \frac{1}{3}$   
 $b = -\frac{2}{3}$

10.  $-x - 3y = 8$   
 $m = -\frac{1}{3}$   
 $b = -\frac{8}{3}$

Draw the line that contains the given point P and has slope m.

11.  $(1, 2)$  and  $m = 2$

12.  $(3, -1)$  and  $m = \text{undefined}$  VUX



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

Write an equation of the line passing through the given point and having slope m.

13.  $(-1, 0)$  and  $m = \frac{2}{3}$   
 $x_1 \ y_1$

14.  $(-1, 3)$  and  $m = 10$

$$y - 0 = \frac{2}{3}(x - (-1))$$

$$y = 10x + 13$$

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

15. Write an equation of the line with slope,  $m = -\frac{3}{4}$ , and y-intercept,  $b = -3$ .

$$y = -\frac{3}{4}x - 3$$

Write an equation of both the vertical and horizontal line through the given point.

16.  $(-2, 3)$

17.  $(0, -2)$

Vertical:  $x = -2$

Vert:  $x = 0$

Horizontal:  $y = 3$

Horiz:  $y = -2$

Write an equation of the line through the given pair of points.

18.  $(-1, 0)$  and  $(3, 1)$   
 $x_1 \ y_1 \ x_2 \ y_2$

19.  $(8, 1)$  and  $(8, -4)$

$m = \text{undefined}$

$$m = \frac{1 - 0}{3 - (-1)} = \frac{1}{4}$$

$$\boxed{x = 8}$$

$$y - 0 = \frac{1}{4}(x - (-1))$$

$$\boxed{y = \frac{1}{4}x + \frac{1}{4}}$$

20.  $(1, 1)$  and  $(0, 2)$

21.  $(0, 300)$  and  $(10, 365)$

$$y = -x + 2$$

$$y = \frac{13}{2}x + 300$$