

Writing and Graphing Linear Equations

Write the slope-intercept form of the equation of the line through the given point with the given slope.

1) through: $(3, -5)$, slope $= -\frac{4}{3}$

$$-5 = -\frac{4}{3}(3) + b$$

$$-5 = -4 + b$$

$$+4 \quad +4$$

$$b = -1$$

$$\boxed{y = -\frac{4}{3}x - 1}$$

2) through: $(-5, -3)$, slope $= \frac{1}{5}$

$$-3 = \frac{1}{5}(-5) + b$$

$$-3 = -1 + b$$

$$+1 \quad +1$$

$$b = -2$$

$$\boxed{y = \frac{1}{5}x - 2}$$

3) through: $(-3, 1)$, slope $= -2$

$$1 = -2(-3) + b$$

$$1 = 6 + b$$

$$-6 \quad -6$$

$$-5 = b$$

$$\boxed{y = -2x - 5}$$

4) through: $(-3, -4)$, slope $= -\frac{1}{3}$

$$-4 = -\frac{1}{3}(-3) + b$$

$$-4 = 1 + b$$

$$-1 \quad -1$$

$$b = -5$$

$$\boxed{y = -\frac{1}{3}x - 5}$$

5) through: $(-3, -4)$, slope $= \frac{5}{3}$

$$-4 = \frac{5}{3}(-3) + b$$

$$-4 = -5 + b$$

$$+5 \quad +5$$

$$b = 1$$

$$\boxed{y = \frac{5}{3}x + 1}$$

6) through: $(-1, 0)$, slope $= -1$

$$0 = -1(-1) + b$$

$$0 = 1 + b$$

$$-1 \quad -1$$

$$b = -1$$

$$\boxed{y = -x - 1}$$

Write the slope-intercept form of the equation of the line through the given points.

7) through: $(-5, 3)$ and $(2, 1)$

$$\frac{3-1}{-5-2} = \frac{2}{-7}$$

$$1 = -\frac{2}{7}(2) + b$$

$$1 = -\frac{4}{7} + b$$

$$+\frac{4}{7} \quad +\frac{4}{7}$$

$$b = \frac{11}{7}$$

$$\boxed{y = -\frac{2}{7}x + \frac{11}{7}}$$

8) through: $(1, -4)$ and $(2, -3)$

$$\frac{-4-(-3)}{1-2} = \frac{-1}{-1} = 1$$

$$-4 = 1(1) + b$$

$$-4 = 1 + b$$

$$-1 \quad -1$$

$$b = -5$$

$$\boxed{y = x - 5}$$

9) through: $(-3, 4)$ and $(-4, -5)$

$$\frac{4-(-5)}{-3-(-4)} = \frac{9}{-1} = -9$$

$$4 = -9(-3) + b$$

$$4 = 27 + b$$

$$-27 \quad -27$$

$$b = -23$$

$$\boxed{y = -9x - 23}$$

10) through: $(2, 0)$ and $(2, 1)$

$$\frac{0-1}{2-2} = \frac{-1}{0} = \text{undefined}$$

$$\boxed{x = 2}$$

11) through: $(1, 4)$ and $(-2, -5)$

$$\frac{4-(-5)}{1-(-2)} = \frac{9}{3} = 3$$

$$4 = 3(1) + b$$

$$4 = 3 + b$$

$$b = 1$$

$$\boxed{y = 3x + 1}$$

12) through: $(5, 0)$ and $(-3, -4)$

$$\frac{0-(-4)}{5-(-3)} = \frac{4}{8} = \frac{1}{2}$$

$$0 = \frac{1}{2}(5) + b$$

$$0 = \frac{5}{2} + b$$

$$-\frac{5}{2} \quad -\frac{5}{2}$$

$$b = -\frac{5}{2}$$

$$\boxed{y = \frac{1}{2}x - \frac{5}{2}}$$

13) through: $(1, 3)$ and $(0, 3)$

$$\frac{3-3}{1-0} = \frac{0}{1} = 0$$

$$\boxed{y = 3}$$

14) through: $(-1, 2)$ and $(-2, -4)$

$$\frac{2-(-4)}{-1-(-2)} = \frac{6}{-1} = -6$$

$$2 = -6(-1) + b$$

$$2 = 6 + b$$

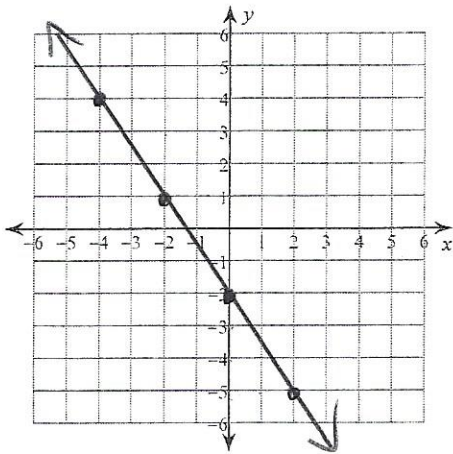
$$-6 \quad -6$$

$$b = -8$$

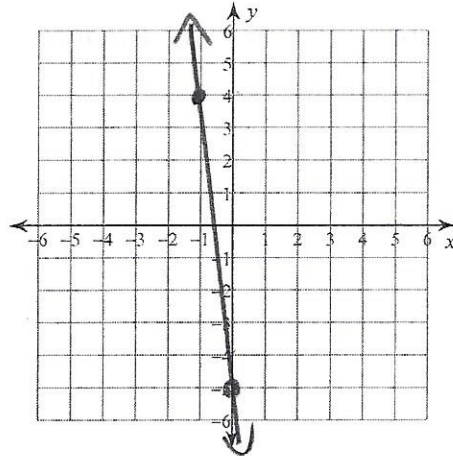
$$\boxed{y = -6x - 8}$$

Graph each line.

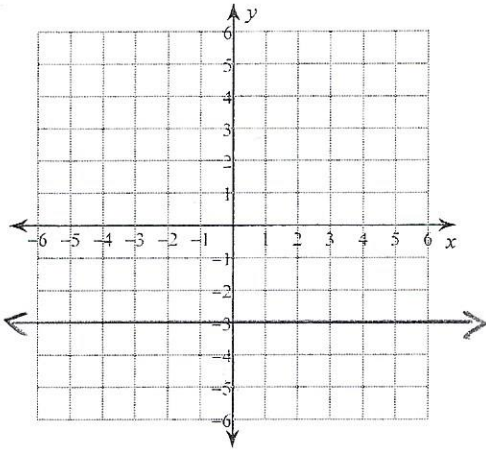
15) $y = -\frac{3}{2}x - 2$



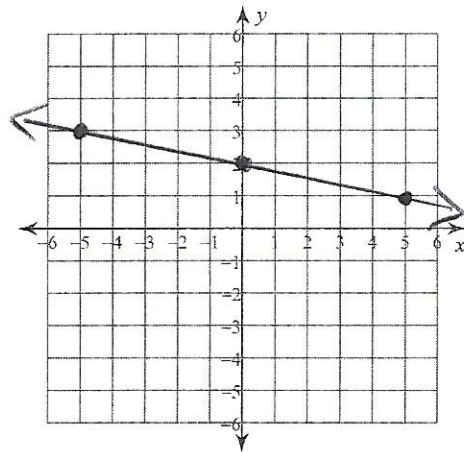
16) $y = -9x - 5$



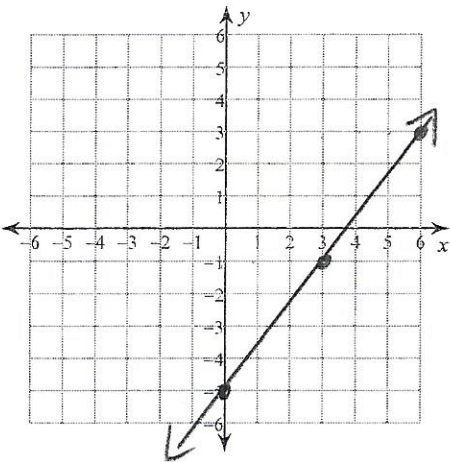
17) $y = -3$



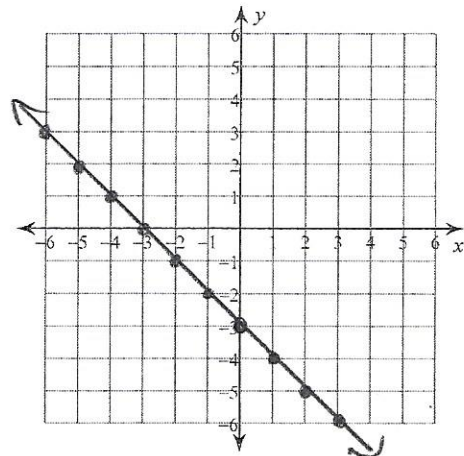
18) $y = -\frac{1}{5}x + 2$



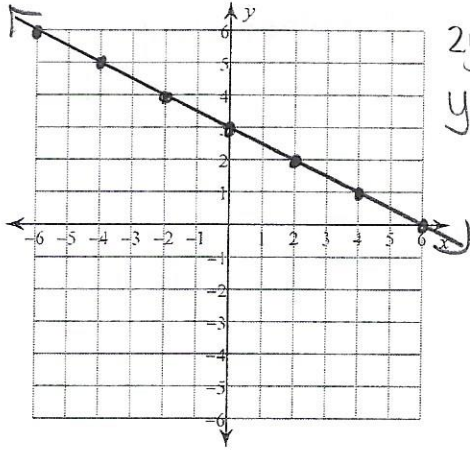
19) $y = \frac{4}{3}x - 5$



20) $y = -x - 3$

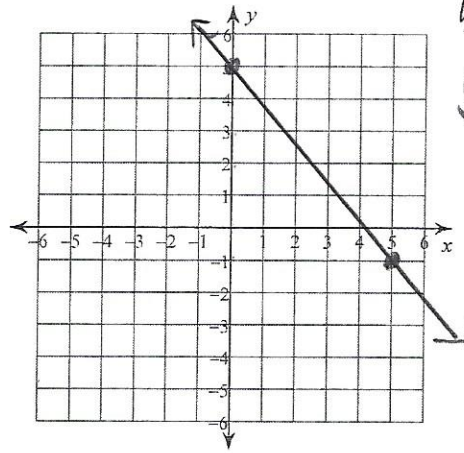


21) $x + 2y = 6$



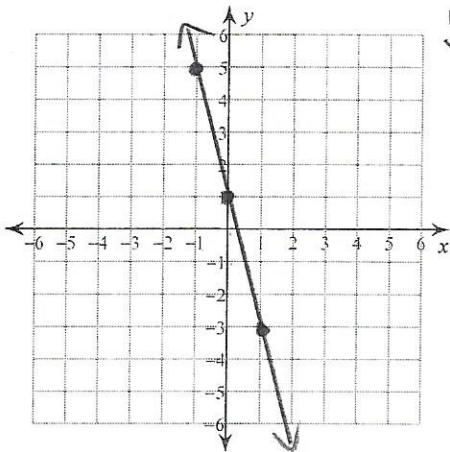
$2y = -x + 6$
 $y = -\frac{1}{2}x + 3$

22) $6x + 5y = 25$



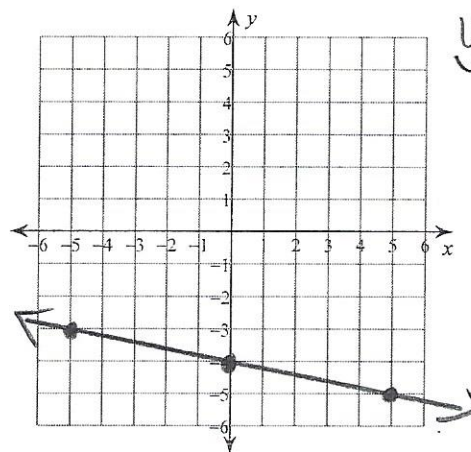
$5y = -6x + 25$
 $y = -\frac{6}{5}x + 5$

23) $4x + y = 1$



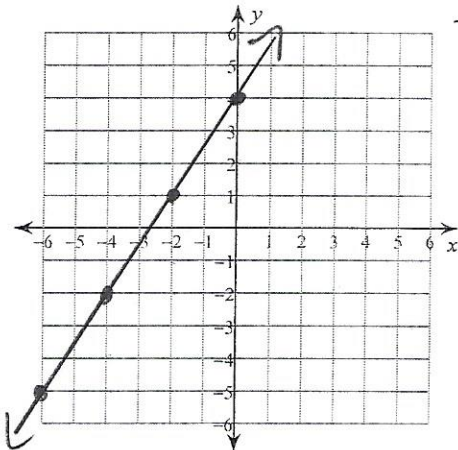
$y = -4x + 1$

24) $-5y = 20 + x$



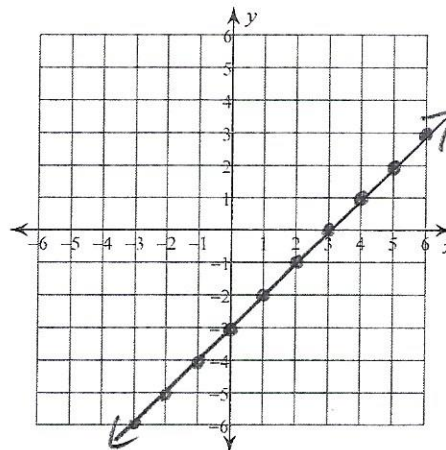
$y = -\frac{1}{5}x - 4$

25) $-2y + 3x = -8$



$-2y = -3x - 8$
 $y = \frac{3}{2}x + 4$

26) $y - x = -3$



$y = x - 3$