

Linear Review

State the domain and range. Determine if the relation is a function, if it is a function determine if it is one-to-one.

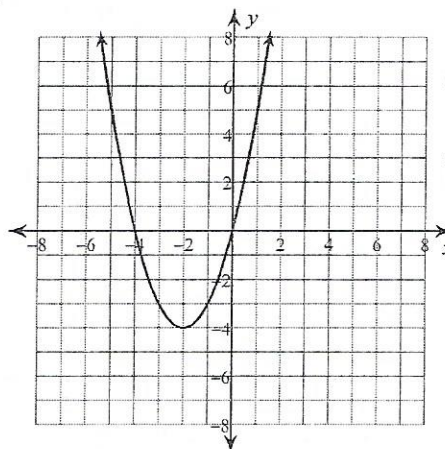
1) $\{(-2, 4), (3, 6), (4, 10), (-5, 6)\}$

$D: \{-5, -2, 3, 4\}$

$R: \{4, 6, 10\}$

Yes it is a function

2)



$D: (-\infty, \infty)$

$R: [-4, \infty)$

Yes it is a function.

3) A machine that originally cost \$15,600 has a value of \$7500 at the end of 3 years. The same machine has a value of \$2800 at the end of 8 years. $(0, 15600)$ $(3, 7500)$ $(8, 2800)$

a. Find the average rate of change in value of the machine between its purchase and the end of 3 years.

$\frac{7500 - 15600}{3 - 0} = \frac{-8100}{3} = -2700$

$\boxed{-\$2700/\text{yr}}$

b. Find the average rate of change in value of the machine between the end of 3 years and the end of 8 years.

$\frac{2800 - 7500}{8 - 3} = \frac{-4700}{5} = -940$

$\boxed{-\$940/\text{yr}}$

c. Interpret the sign of your answers.

The machine's value is decreasing

Evaluate each function.

4) $g(x) = 2x + 1$; Find $g(-8)$

$g(-8) = 2(-8) + 1 = -16 + 1 = -15$

$g(-8) = -15$

5) $h(t) = t^2 + 5t$; Find $h(4)$

$4^2 + 5(4) = 16 + 20 = 36$

6) $h(x) = -x^3 + 4x$; Find $h(4)$

$-(4)^3 + 4(4) = -64 + 16 = -48$

7) $h(n) = -3|n| - 2$; Find $h(-3)$

$-3|-3| - 2 = -3(3) - 2 = -9 - 2 = -11$

Write the standard form of the equation of each line.

8) $0 = -y - 5x - 2$

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

9) $3x + 16 - 4y = 0$

$\boxed{3x - 4y = -16}$

Write the slope-intercept form of the equation of each line.

10) $x - 4y = -20$

$$\cancel{y} = \frac{-x-20}{-4} \quad \boxed{y = \frac{1}{4}x + 5}$$

11) $y + 1 = -\frac{3}{4}(x - 4)$

$$\cancel{y} + 1 = -\frac{3}{4}x + 3 \quad \boxed{y = -\frac{3}{4}x + 2}$$

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

12) through: $(5, 5)$, slope = $\frac{7}{5}$

$$5 = \frac{7}{5}(5) + b$$

$$\begin{aligned} 5 &= 7 + b \\ -7 & \quad -7 \\ \hline b &= -2 \end{aligned}$$

$$\boxed{y = \frac{7}{5}x - 2}$$

13) through: $(1, -5)$, slope = -3

$$-5 = -3(1) + b$$

$$-5 = -3 + b$$

$$\begin{aligned} +3 & \quad +3 \\ \hline b &= -2 \end{aligned}$$

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

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

14) through: $(2, -1)$ and $(-5, 2)$

$$\frac{-1-2}{2+5} = \frac{-3}{7} \quad -1 = \frac{-3}{7}(2) + b$$

$$-1 = \frac{-6}{7} + b$$

$$\begin{aligned} +\frac{6}{7} & \quad +\frac{6}{7} \\ \hline b &= \frac{-1}{7} \end{aligned} \quad \boxed{y = \frac{-3}{7}x - \frac{1}{7}}$$

15) through: $(5, -5)$ and $(-3, -5)$

$$\frac{-5+5}{5+3} = \frac{0}{8} = 0 \quad -5 = 0(x) + b$$

$$b = -5$$

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

Write the slope-intercept form of the equation of the line described.

16) through: $(-3, -5)$, parallel to $y = \frac{8}{3}x + 4$

$$-5 = \frac{8}{3}(-3) + b$$

$$-5 = -8 + b$$

$$\begin{aligned} +8 & \quad +8 \\ \hline b &= 3 \end{aligned}$$

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

$$y + 5 = \frac{8}{3}(x + 3)$$

$$y + 5 = \frac{8}{3}x + 8$$

$$\begin{aligned} -5 & \quad -5 \\ \hline y &= \frac{8}{3}x + 3 \end{aligned}$$

17) through: $(-2, -5)$, perp. to $y = \frac{1}{3}x + 5$

$$-5 = (-3)(-2) + b$$

$$-5 = 6 + b$$

$$\begin{aligned} -6 & \quad -6 \\ \hline b &= -11 \end{aligned}$$

$$\boxed{y = -3x - 11}$$

18) through: $(4, -3)$, parallel to $y = -\frac{3}{4}x + 1$

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

$$-3 = -3 + b$$

$$\begin{aligned} +3 & \quad +3 \\ \hline b &= 0 \end{aligned}$$

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

19) through: $(-5, -2)$, perp. to $y = -\frac{5}{6}x - 3$

$$-2 = \frac{6}{5}(-5) + b$$

$$-2 = -6 + b$$

$$\begin{aligned} +6 & \quad +6 \\ \hline b &= 4 \end{aligned}$$

$$\boxed{y = \frac{6}{5}x + 4}$$

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

20) through: $(5, -4)$, slope = $-\frac{2}{5}$

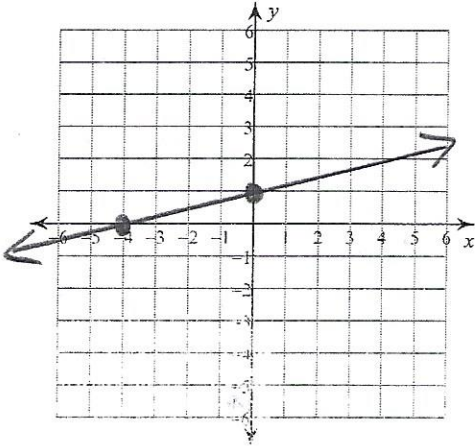
$$\boxed{y + 4 = -\frac{2}{5}(x - 5)}$$

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

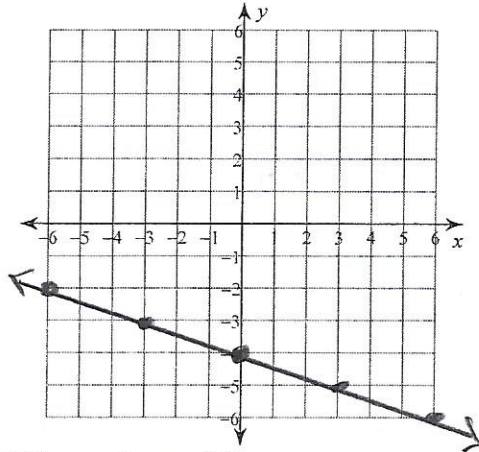
21) through: $(-2, -4)$ and $(-3, -3)$ $\frac{-4+3}{-2+3} = \frac{-1}{1} = -1$ $y+4 = -1(x+2)$
 $y+3 = -1(x+3)$

Sketch the graph of each line.

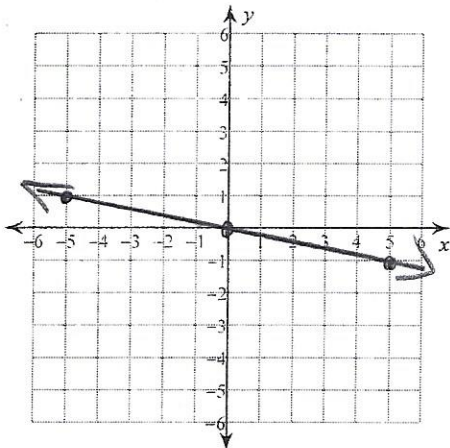
22) x -intercept = -4 , y -intercept = 1



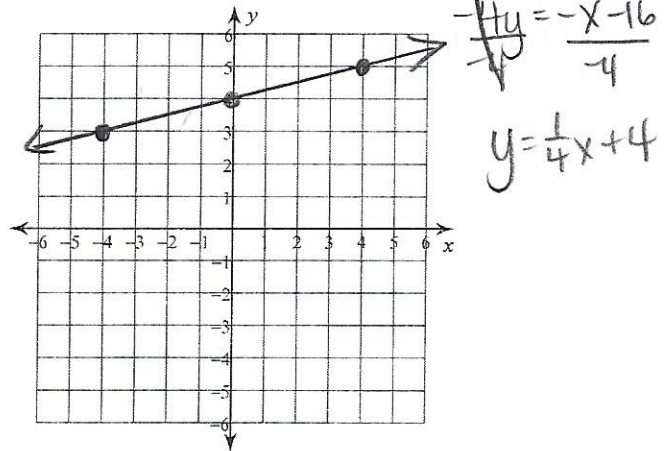
23) $y = -\frac{1}{3}x - 4$



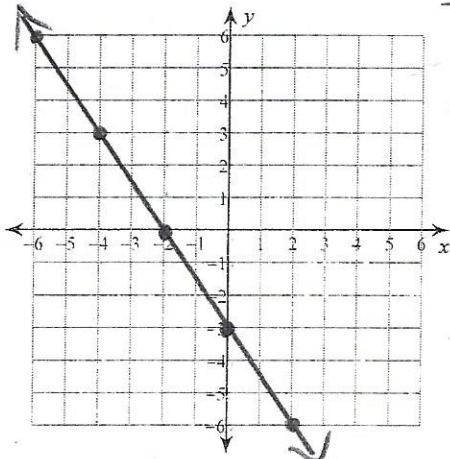
24) $y = -\frac{1}{5}x$



25) $x - 4y = -16$

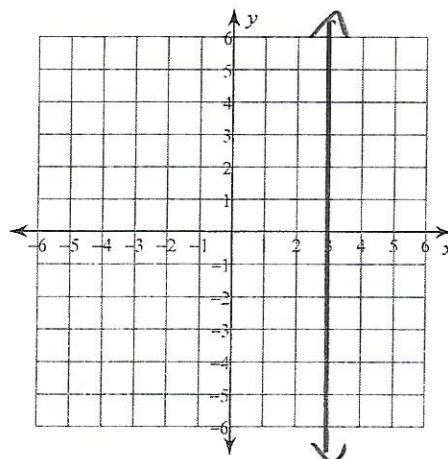


26) $3x + 2y = -6$



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

27) $-9 + 3x = 0$



$\frac{3x}{3} = \frac{9}{3}$
 $x = 3$