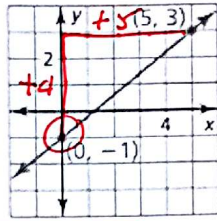


1a) Write an equation of the line with a slope of -2 and y-intercept of 3 .

$$y = -2x + 3$$

1b) Write an equation of the line in slope-intercept form.



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

2) Write an equation of the line that passes through the points $(0, -5)$ and $(4, 7)$

$$m = \frac{7 - (-5)}{4 - 0} = \frac{12}{4} = 3$$

$$y = 3x - 5$$

3) Write a linear function f with the values $f(0) = 6$ and $f(4) = -6$

$$m = \frac{-6 - 6}{4 - 0} = \frac{-12}{4} = -3$$

$$y = -3x + 6$$

4) In 2006, a company had sales of \$10 million. In 2011, sales were \$12.5 million.

Write a linear model that represents the company's sales as a function of the number of years since 2006.

Use the model to predict the sales in 2021.

$$m = \frac{12.5 - 10}{5 - 0} = \frac{2.5}{5} = \frac{1}{2}$$

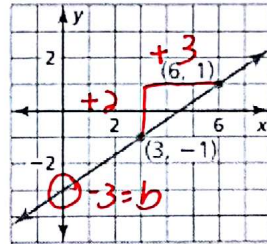
$$y = \frac{1}{2}x + 10$$

$$y = \frac{1}{2}(15) + 10 = \$17.5 \text{ million}$$

5) Write an equation in point-slope form of the line that passes through the point $(3, -5)$ and has a slope of 2.

$$y + 5 = 2(x - 3)$$

6) Write an equation in slope-intercept form of the line shown.



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

7) Write a linear function f with the values $f(1) = 1$ and $f(-3) = 17$

$$m = \frac{17-1}{-3-1} = \frac{16}{-4} = -4$$

$$y - 1 = -4(x - 1) \text{ or}$$

$$y - 17 = -4(x + 3) \text{ or}$$

$$y = -4x + 5$$

8) Tell whether the data in the table can be modeled by a linear equation. Explain. If possible, write a linear equation that represents y as a function of x

x	3	5	12	20
y	7	10	16	26

Handwritten annotations above the table show differences: $+2$ (between $x=3$ and $x=5$), $+7$ (between $x=5$ and $x=12$), and $+8$ (between $x=12$ and $x=20$). Below the table, differences in y are shown: $+3$ (between $y=7$ and $y=10$), $+6$ (between $y=10$ and $y=16$), and $+10$ (between $y=16$ and $y=26$).

Not consistent, so nonlinear

9) Line a passes through $(-1, -5)$ and $(1, 3)$. Line b passes through $(-3, -7)$ and $(1, 9)$. Line c passes through $(0, -2)$ and $(4, -3)$. Which lines are parallel or perpendicular? Explain.

$m_a = \frac{3+5}{1+1} = \frac{8}{2} = 4$ $a \nparallel b$ parallel b/c same slope.
 $m_b = \frac{-7-9}{-3-1} = \frac{-16}{-4} = 4$ $c \perp$ to $a \& b$ b/c opposite reciprocal
 $m_c = \frac{-2+3}{0-4} = \frac{-1}{-4} = \frac{1}{4}$

11) Write an equation of the line that passes through $(0, -2)$ and is perpendicular to the line $y = \frac{1}{5}x - 2$.

$m = -5$

$y + 2 = -5x$ or

$y = -5x - 2$

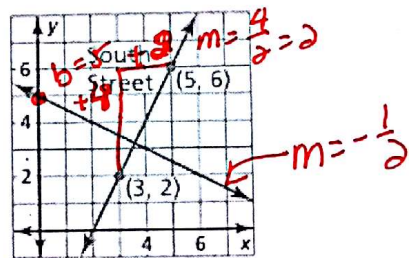
10) Write an equation of the line that passes through $(-2, 3)$ and is parallel to the line

$y = 2x - 1$

$y - 3 = 2(x + 2)$ or

$y = 2x + 7$

12) A road is constructed perpendicular to South Street. Write an equation that represents this new road.



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