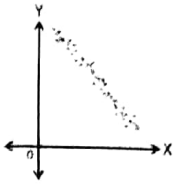
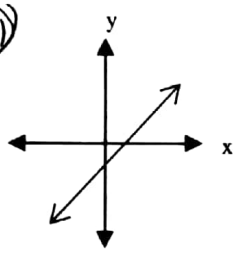
Chapter 6 Linear Functions Name _____

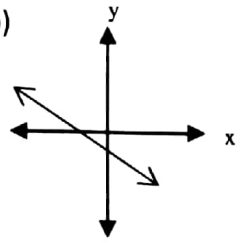
1. What is the best estimate of the correlation coefficient for the following scatter plot?

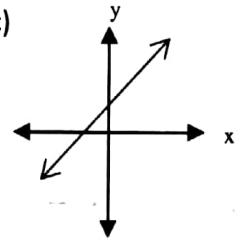


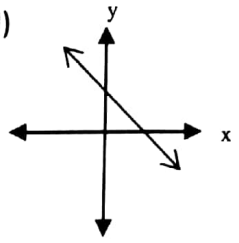
a) r = -0.95 b) r = 0.95 c) r = -0.10 d) r = 0.10

2. Which of the following graphs could represent y=mx+b if m is positive and b is negative?

a) 

b) 

c) 

d) 

3. Write this equation in slope-intercept form: $10x + 3y - 4 = 0$

$\frac{10x}{-3} - \frac{4}{-3} = \frac{-3y}{-3}$

$-\frac{10}{3}x + \frac{4}{3} = y$

a. $y = \frac{10}{3}x - \frac{4}{3}$

b. $y = -\frac{10}{3}x + \frac{4}{3}$

c. $y = -\frac{10}{3}x - 4$

d. $y = \frac{10}{3}x + \frac{4}{3}$

4. Write an equation for the line that passes through T(–3, 3) and is parallel to the line $y = 7x - 10$.

same slope

$y - 3 = 7(x + 3)$

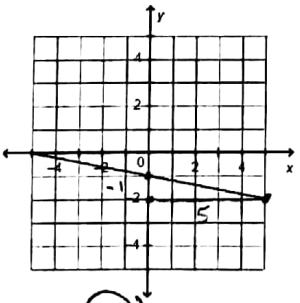
a. $y + 3 = 7(x - 3)$

b. $y - 3 = 7(x + 3)$

c. $y - 3 = -\frac{1}{7}(x + 3)$

d. $y + 3 = -\frac{1}{7}(x - 3)$

5. Write an equation to describe this graph:



$b = -1$

$m = \frac{-1}{5}$

a. $y = \frac{1}{5}x + 1$

b. $y = \frac{1}{5}x - 1$

c. $y = -\frac{1}{5}x - 1$

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

6. Write an equation in slope-point form for the line that passes through A(–2, 4) and B(–9, 6).

x y

$m = \frac{\Delta y}{\Delta x} = \frac{6-4}{-9-(-2)} = \frac{2}{-7}$

a. $y + 4 = -\frac{2}{7}(x - 2)$

b. $y - 6 = -\frac{2}{7}(x + 2)$

c. $y + 6 = \frac{2}{7}(x - 2)$

d. $y - 4 = -\frac{2}{7}(x + 2)$

7. A line has x-intercept 2 and y-intercept 6. Determine the slope of the line.

a. $\frac{1}{3}$
b. 3
c. -3
d. $-\frac{1}{3}$

pt (2, 0)
pt (0, 6)
$m = \frac{\Delta y}{\Delta x} = \frac{6-0}{0-2} = \frac{6}{-2} = -3$

8. Determine the slope of a line that is perpendicular to the line through W(–9, 7) and X(6, –10).

a. $\frac{15}{17}$
b. $-\frac{17}{15}$
c. -15
d. $-\frac{15}{17}$

negative reciprocal
neg rec $m = \frac{15}{17}$
$m = \frac{\Delta y}{\Delta x} = \frac{-10-7}{6-(-9)} = \frac{-17}{15}$

9. Write an equation for the graph of a linear function that has slope 8 and passes through R(4, –3).

a. $y + 3 = 8(x - 4)$
b. $y - 3 = 8(x + 4)$
c. $y + 3 = \frac{1}{8}(x - 4)$
d. $y + 3 = -8(x - 4)$

$(y + 3) = 8(x - 4)$

10. Write this equation in slope-intercept form: $y - 3 = -\frac{1}{5}(x + 2)$

a. $y = -x + \frac{13}{5}$
b. $y = -\frac{3}{5}x + \frac{13}{5}$
c. $y = \frac{1}{5}x + \frac{13}{5}$
d. $y = -\frac{1}{5}x + \frac{13}{5}$

$y - 3 = -\frac{1}{5}x - \frac{2}{5}$ (+3 to both sides)
$y = -\frac{1}{5}x + \frac{13}{5}$
$3 = \frac{15}{5}$

11. Determine the y-intercept of the graph of this equation: $y - 3 = 2(x + 5)$

a. -13
b. 13
c. -10
d. 3

when $x = 0$
$y - 3 = 2(0 + 5)$
$y - 3 = 10$ (+3)
$y = 13$

12. Write this equation in general form: $y = -\frac{3}{2}x + 8$

a. $3x + 2y - 8 = 0$
b. $-3x - 2y - 16 = 0$
c. $3x + 2y - 16 = 0$
d. $3x - 2y + 8 = 0$

$0 = -\frac{3}{2}x - y + 8$ (−y, ·−2)
$0 = 3x + 2y - 16$

13. Write this equation in general form: $y + 5 = \frac{5}{3}(x - 3)$

a. $5x - 3y - 30 = 0$
b. $5x - 3y - 8 = 0$
c. $5x - 3y = -8$
d. $5x + 3y - 30 = 0$

$y + 5 = \frac{5}{3}x - 5$ (−5)
$y = \frac{5}{3}x - 10$ (·3)
$0 = 5x - 3y - 30$

14. Which graph represents the equation $4x - 5y - 20 = 0$?

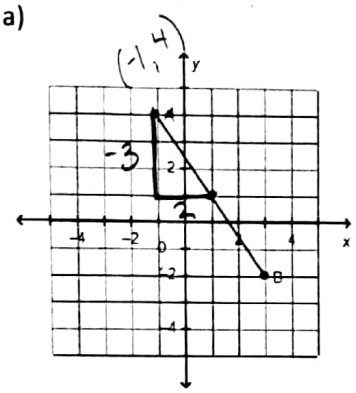
a.
b.
c.
d.

x int ($y = 0$) $\frac{4x}{4} = \frac{20}{4}$ $x = 5$
y int ($x = 0$) $\frac{-5y}{-5} = \frac{20}{-5}$ $y = -4$

Constructed Response

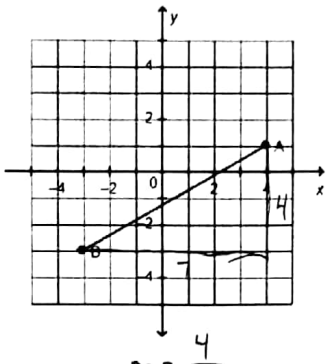
1. Determine the slope:

a)



$m = -\frac{3}{2}$

b)



$m = \frac{4}{7}$

2. Write an equation for the line that passes through E(–3, –7) and F(2, 10). Write the equation in slope-point form and in slope-intercept form.

$m = \frac{\Delta y}{\Delta x} = \frac{10-(-7)}{2-(-3)} = \frac{17}{5}$

$(y+7) = \frac{17}{5}(x+3)$

or

$(y-10) = \frac{17}{5}(x-2)$

$y + 7 = \frac{17}{5}x + \frac{51}{5}$ -7 -7

$y = \frac{17}{5}x + \frac{16}{5}$

$7 = \frac{35}{5}$

3. a) Determine the *x*- and *y*-intercepts of the graph of this equation: $5x + 8y + 40 = 0$
   b) Graph the equation.

x int ($y = 0$)

$5x + 8(0) + 40 = 0$

$\frac{5x}{5} = \frac{-40}{5}$

$x = -8$

$(-8, 0)$

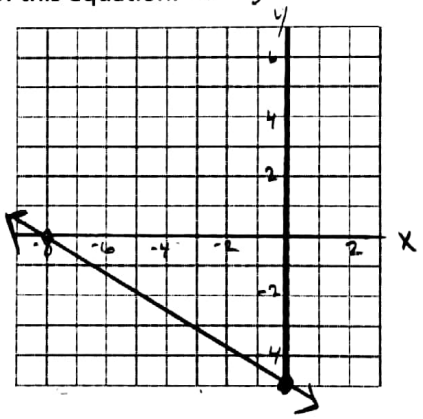
y int ($x = 0$)

$5(0) + 8y + 40 = 0$

$\frac{8y}{8} = \frac{-40}{8}$

$y = -5$

$(0, -5)$



m

4. From January 2010 to August 2010, the amount of money in Shannon's savings account increased by $75 per month. In May 2010, there was approximately $534 in her savings account. Write an equation in slope-point form to represent the amount of money in her savings account, *s*, as a function of the number of months, *n*, since December 2009.

(5, 534)

$y - 534 = 75(x - 5)$

5. The coordinates of the vertices of ΔGBW are G(20, 10), B(–35, 20), and W(5, –10). Is ΔGBW a right triangle? Justify your answer.

$m_{BG} = \frac{\Delta y}{\Delta x} = \frac{20-10}{-35-20} = \frac{10}{-45}$

$= -\frac{2}{9}$

$m_{GW} = \frac{10-(-10)}{20-5} = \frac{20}{15}$

$= \frac{4}{3}$

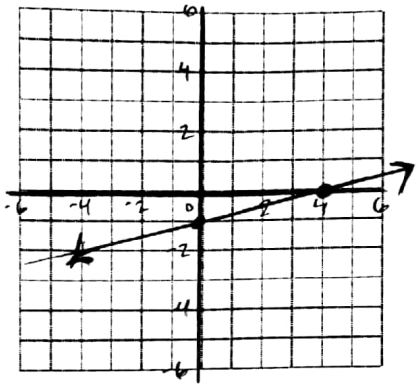
$m_{BW} = \frac{20-(-10)}{-35-5} = \frac{30}{-40}$

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

negative reciprocals

∴ ΔGBW is a right triangle

6. Graph this equation: $x - 4y - 4 = 0$



x int ($y=0$)
$x - 4 = 0$
$x = 4$

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

7. An equation of a line is $y = mx + 3$. Determine the value of m when the line passes through the point J(–5, 2).

y int -> $b = 3$ so $x = 0$
pt $(0, 3)$

$m = \frac{\Delta y}{\Delta x} = \frac{2-3}{-5-0} = \frac{-1}{-5} = \frac{1}{5}$

8. Jess runs a T-shirt company. For each order she receives, Jess charges a flat fee of \$50, plus \$8.95 per T-shirt .

a) Write an equation for the total cost, C dollars, for ordering n T-shirts. $C = 8.95n + 50$

b) You ordered 62 T-shirts. What was the total cost? $n = 62$ $C = 8.95(62) + 50$
$C = \$604.90$

c) Alec paid a total cost of \$971.85. How many T-shirts did he order?
$971.85 = 8.95n + 50$ (−50 −50)
$\frac{921.85}{8.95} = \frac{8.95n}{8.95}$ $n = 103$

9. Write an equation for the line that passes through B(–1, 3) and is perpendicular to the line $y = \frac{7}{3}x - 3$

$m = \frac{3}{7}$ $(y - 3) = \frac{3}{7}(x + 1)$

10. Determine the value of k when the equations $3kx - 7y - 10 = 0$ and $2x + y - 7 = 0$ represent parallel lines.

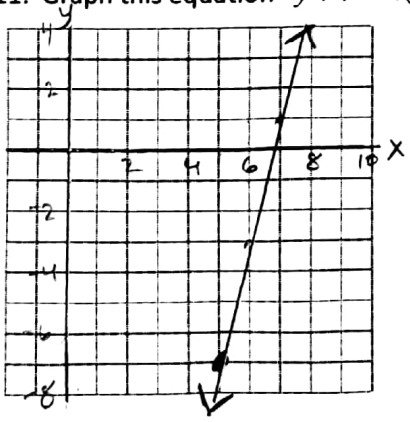
$-7y = -3kx + 10$
$\frac{-7}{-7}$
$y = \frac{3}{7}kx - \frac{10}{7}$

$y = -2x + 7$

$\cdot\frac{7}{3}$ $\cdot\frac{7}{3}$
$\frac{3}{7}k = -2$

$k = \frac{-14}{3}$

11. Graph this equation $y + 7 = 4(x - 5)$



pt $(5, -7)$
$m = 4$