Answer Key

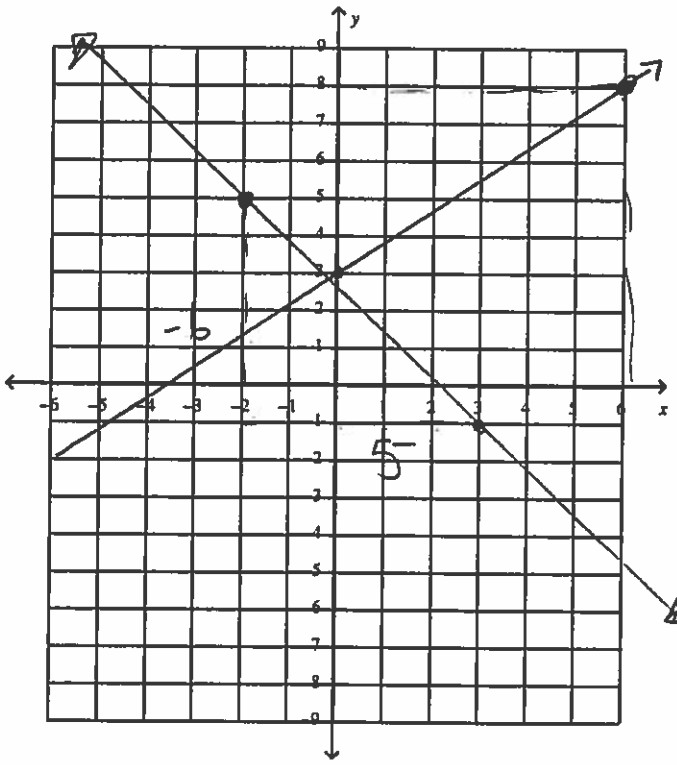
Chapter 7 - 2

Name:_____

1. Points A(-2, 5) and B(3, –1) are on a line.

$x_1\ y_1$ $x_2\ y_2$

a) Plot points A and B on the graph and draw the line that passes through them. (1 mark – GR)



$y = -\frac{6}{5}x + \frac{13}{5}$

b) Write the equation of the line in ***slope y intercept*** form. Your graph is only a sketch and is not that accurate; therefore use mathematical calculations to do this. (2 marks – AR)

$m = \frac{\text{rise}}{\text{run}}$ or $\frac{y_2 - y_1}{x_2 - x_1}$

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

$= \frac{-6}{5}$

$y = mx + b$

$5 = \frac{-6}{5}\left(\frac{-2}{1}\right) + b$

$5 = \frac{12}{5} + b$

$\frac{13}{5} = b$

$y = \frac{-6}{5}x + \frac{13}{5}$

c) Write an equation of another line, with a y-intercept of 3, that is ***perpendicular*** to the line you drew in part a). Express this equation in ***slope-point form***. (2 marks – AR)

$m = \frac{5}{6}$ reciprocal & change the sign

(0,3)

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

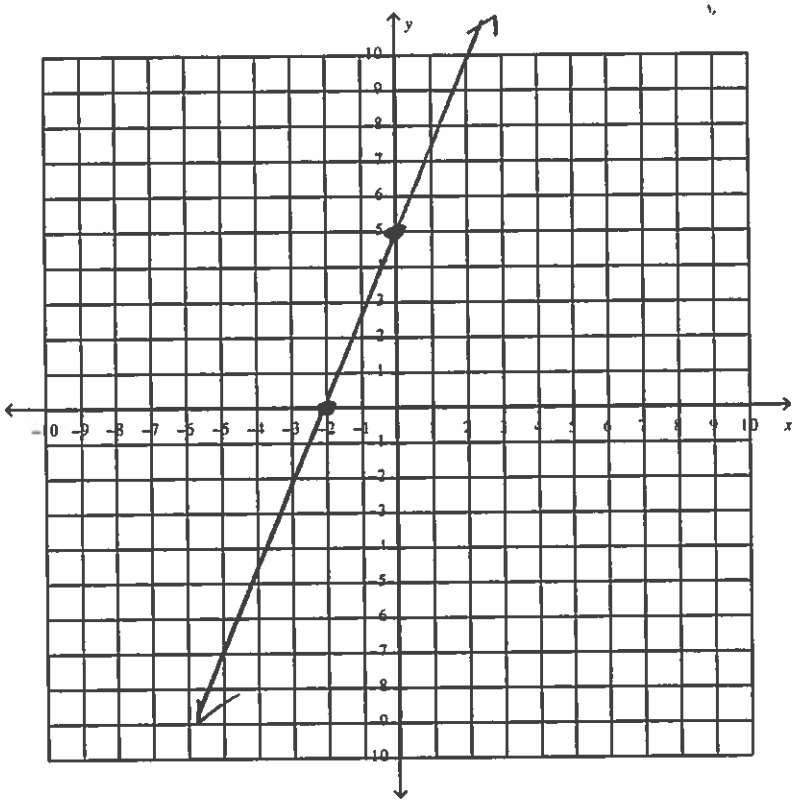
$y - 3 = \frac{5}{6}(x - 0)$

any point would work such as (6,8)

$y - 8 = \frac{5}{6}(x - 6)$

2. Calculate the x and y intercept and graph the line. (2 marks – AR, 1 mark – GR)

$5x - 2y + 10 = 0$



Show Intercept Work Here

x int ($y = 0$)

$5x - 2(0) + 10 = 0$

$5x + 10 = 0$

$5x = -10$

$x = -2$

y int ($x = 0$)

$5(0) - 2y + 10 = 0$

$-2y + 10 = 0$

$-2y = -10$

$y = 5$

3. Rewrite each equation from slope-point form to slope – y intercept form, $y = mx + b$, and general form, $Ax + By + C = 0$ (2 marks – AR)

$y = mx + b$

$y - 8 = \frac{6}{5}(x - 3)$

$y - 8 = \frac{6}{5}x - \frac{18}{5}$

$y = \frac{6}{5}x - \frac{18}{5} + 8$

$y = \frac{6}{5}x + \frac{22}{5}$

$y = mx + b$

$y - 8 = \frac{6}{5}(x - 3)$

$Ax + By + C = 0$

$y = \frac{6}{5}x + \frac{22}{5}$

$0^{\times 5} = \left(\frac{6}{5}x - y + \frac{22}{5}\right)^{\times 5}$

$0 = 6x - 5y + 22$

4. Write the equation of a line in the form y = mx + b for a line parallel to 2x – 4y + 10 = 0 and has an x-intercept of -4. (3 marks – AR)

$(-4,0)$ $m_{\parallel} = m = 1/2$

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

$0 = \frac{1}{2}(-4) + b.$

$0 = -2 + b \Rightarrow b = 2$

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

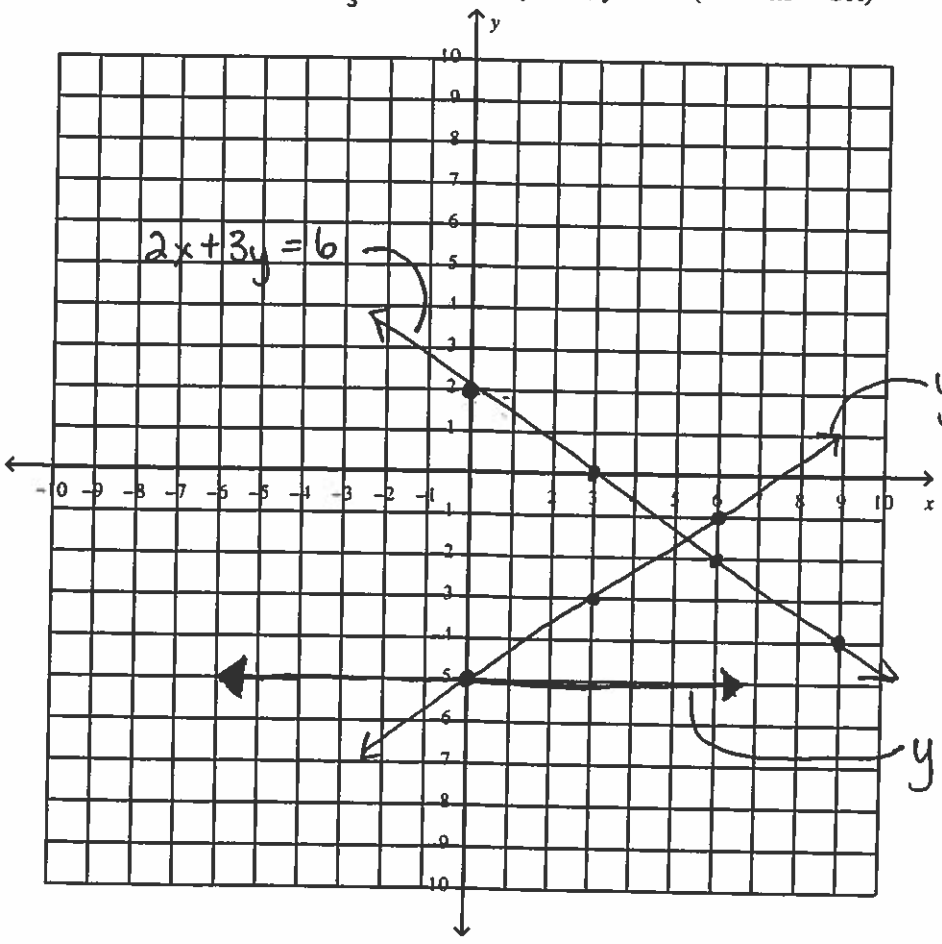
$4y = 2x + 10$

$y = \frac{2}{4}x + \frac{10}{4}$

$y = \frac{1}{2}x + 5/2$

$m = 1/2$

5. Graph the equations $y = \frac{2}{3}x - 5$, $2x + 3y = 6$, $y = -5$. (3 marks – GR)

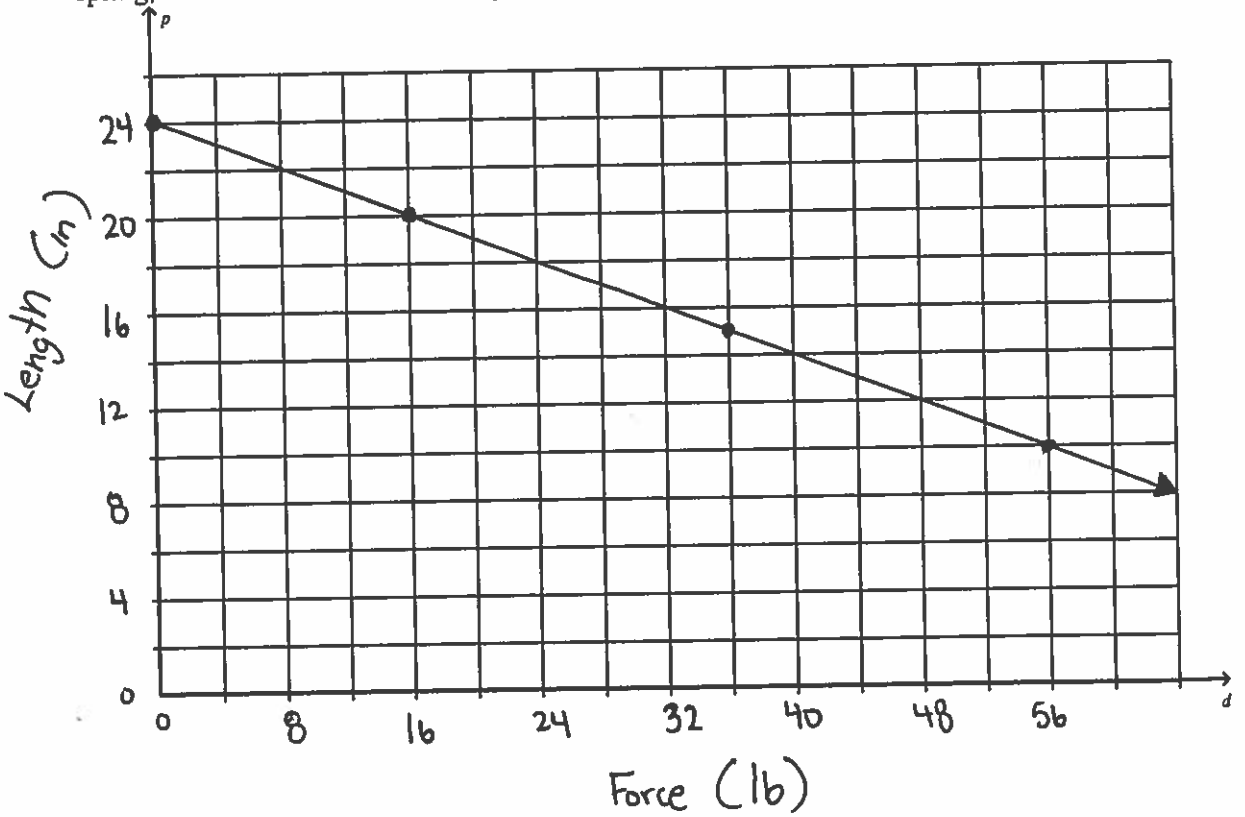


$3y = -2x + 6$

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

6. A spring that is 24 inches long is compressed to 20 inches by a force of 16 pounds, and to 15 inches by a force of 36 pounds.

a) Plot the coordinates (F,L) on a grid, where F is the force applied (in pounds), and L is the length of the spring, in inches. Draw a line through the points. (2 marks – GR)



b) Determine an equation for the line in the form $L = mF + b$. (1 marks – AR)

$m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{20-15}{16-36} = \frac{5}{-20} = \frac{-1}{4}$

(16, 20) (36, 15)

$L = \frac{-1}{4}F + b$.

$20 = \frac{-1}{4}(16) + b$

$20 = -4 + b$

$b = 24$

$L = \frac{-1}{4}F + 24$

c) Identify what the slope and the L-intercept represent. (2 marks – GR)

The slope is $\frac{-1}{4}$ this means that for every 4 pounds the spring will be compressed 1 inch.

The L intercept is 24 inches. this means that the uncompressed spring is 24 inches long

d) How much force is needed to compress the spring to 10 inches? (1 mark – GR)

$L = \frac{-1}{4}F + 24$

$10 = \frac{-1}{4}F + 24$

$-14 = \frac{-1}{4}F$

$F = 56$ lbs.

The force needed to compress the spring to 10 inches is 56 lbs.