Foundations Pre Calculus 10

Name : Key Block : _____

Chapter 6 – Linear Functions

1. Determine the slope of a line passing through the following points and tell whether the slope is positive, negative, zero or undefined.
   a. P (3 , -2) and Q (-1 , 6)

$$PQ = \frac{6 - -2}{-1 - 3} = \frac{8}{-4} = -2$$

   b. R (2 , 4) and S (2 , -1)

$$RS = \frac{-1 - 4}{2 - 2} = \frac{-5}{0} = \text{undefined}$$

1. Given the graph write the equation of the line in:
   a) Point Slope form

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

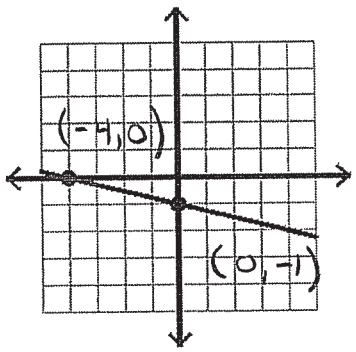
$m = -\frac{1}{4}$

a) P(0,-1)

b) P(-4,0)

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

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



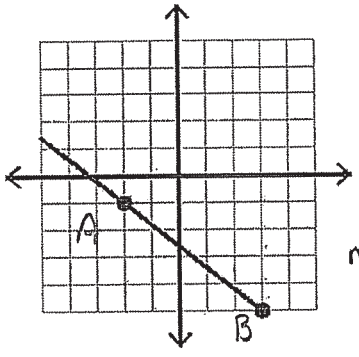
   b) Slope Y-intercept form

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

2. Given the graph write the equation of the line in:
   a) Point Slope form

A. $y + 1 = -\frac{4}{5}(x + 2)$

B. $y + 5 = -\frac{4}{5}(x - 3)$



$m = -\frac{4}{5}$

A (-2,-1)

B (3,-5)

   b) Slope Y-intercept form

$y = mx + b$

$m = -\frac{4}{5}$

A(-2,1)

$-1 = -\frac{4}{5}(-2) + b$

$-1 = \frac{8}{5} + b$

$-5 = 8 + 5b$

$-8 \quad -8$

$-13 = 5b$

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

3. Write an equation for the line that passes through A(4,3) and is parallel to the line $y = \frac{1}{2}x + 2$.

x_1, y_1

a) Point Slope form

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

b) Slope Y-intercept form

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

4. Write an equation for the line that passes through A(-4,1) and is perpendicular to the line $y = \frac{2}{3}x + 6$

x_1, y_1

a) Point Slope form

$\frac{2}{3} \perp -\frac{3}{2}$

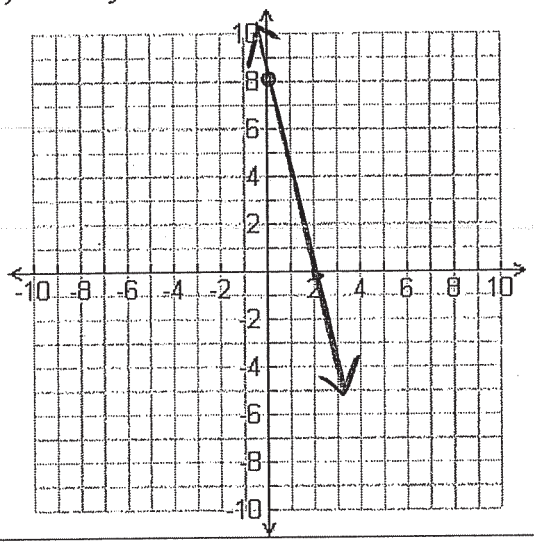
$$y - 1 = -\frac{3}{2}(x + 4)$$

b) Slope Y-intercept form

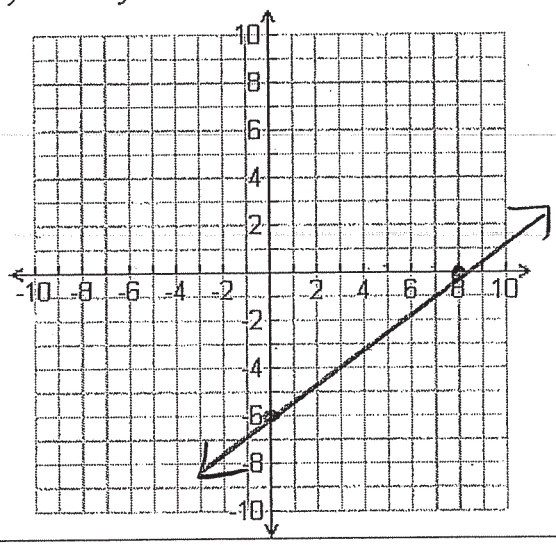
$$y - 1 = -\frac{3}{2}x - 6$$
$$+1 \qquad +1$$
$$y = -\frac{3}{2}x - 5$$

5. Graph the lines.

a) $4x + y - 8 = 0$



b) $3x - 4y - 24 = 0$



a) $y - 8 = 0$

$y = 8$

b) $4x - 8 = 0$

$4x = 8$

$x = 2$

a) $-4y - 24 = 0$

$+24 \quad +24$

$-4y = 24$

$y = -6$

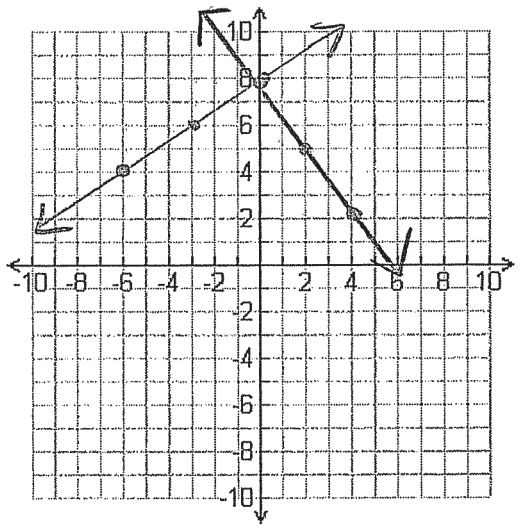
b) $3x - 24 = 0$

$+24 \quad +24$

$3x = 24$

$x = 8$

6. Two **perpendicular** lines intersect on the y-axis. One line has equation: $y - 4 = \frac{2}{3}(x + 6)$. What is the equation of the other line in Slope-Point Form?



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

$+4 \qquad +4$

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

So $m = -\frac{3}{2}$ b (0, 8)

$y - 8 = -\frac{3}{2}(x - 0)$

General Form: $Ax + By + C = 0$

$\times 5 \quad \times 5 \quad \times 5$

7. Write : $y = \frac{-2}{5}x + 2$ in General Form.

$5y = -2x + 10$

$2x + 5y - 10 = 0$

8. Write: $y - 5 = \frac{2}{5}(x - 7)$ in General Form.

$\times 5 \quad \times 5 \quad \times 5 \quad \times 5$

$y - 5 = \frac{2}{5}x - \frac{14}{5}$

$5y - 25 = 2x - 14$

$+25 \qquad +25$

$2x - 5y + 11 = 0$

9. Determine the x-intercept and the y-intercept of the line whose equation is: $6x - 4y - 3 = 0$

$-4y = 3$ $\qquad 6x = 3$

x-intercept: (0, -3/4) y-intercept: (1/2, 0)

10. Determine the slope of a line with equation: $2x - 4y + 10 = 0$

$+4y \qquad +4y$

$\frac{2x}{4} + \frac{10}{4} = \frac{4y}{4}$ $\qquad y = \frac{1}{2}x + \frac{5}{2}$

$m = 1/2$