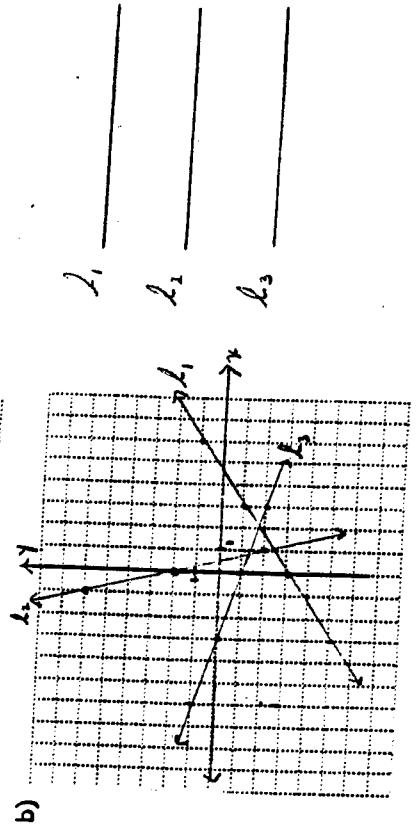
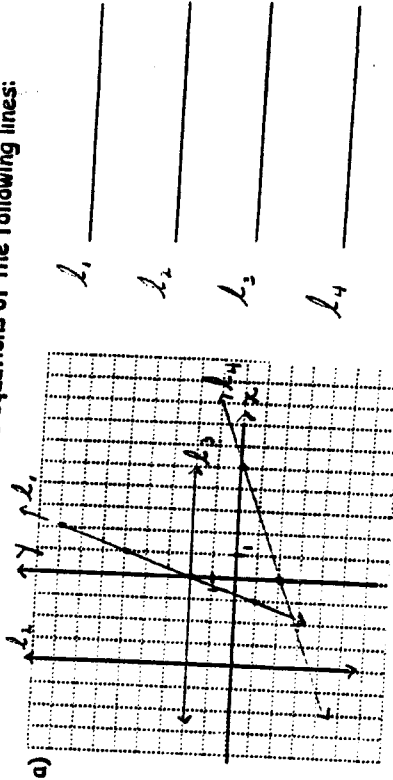


Determining the Equation of a Line

- Determine the equation of the line, without the use of a graph and given the following information:

- slope of 3 and passing through the point (2, -5)
- slope of -2 and passing through the point (4, 3)
- slope of 5 and going through the point (-4, 0)
- slope of -6 and going through the point (-1, -2)
- going through the point (-3, 6) and parallel to the line $y = 2x + 4$
- going through the point (-2, -6) and parallel to the line $y = \frac{1}{4}x + 1$
- going through the point (6, -2) and perpendicular to the line $y = \frac{3}{4}x - 4$
- going through the point (-8, 1) and perpendicular to the line $y = -2x$

- Given the graphs, determine the equations of the following lines:



MPM 2D 2. Determining Equations of Parallel and Perpendicular Lines

Part A Determine the equation of the line given the information.

- The line has a y-intercept of 3 and is parallel to $y = -3x + 4$.
- The line has a y-intercept of -7 and is perpendicular to $y = 4x - 5$.
- The line goes through the point (3, -4) and is parallel to $y = -3x + 2$.
- The line goes through the point (-5, 6) and is perpendicular to $y = \frac{1}{3}x + 2$.

- The line goes through the point (8, -1) and is perpendicular to $y = -\frac{2}{5}x + 4$.

- The line is parallel to $y = \frac{1}{4}x + 2$ and goes through the point $(\frac{2}{3}, -\frac{5}{6})$
- The line is perpendicular to $y = -5x$ and has a y-intercept at the origin.

Part B Graph each line below and then construct a perpendicular line to it. State the equation of each perpendicular line.

- $y = -3x + 2$ perpendicular line equation _____
- $y = \frac{1}{2}x + 2$ perpendicular line equation _____
- $y = \frac{3}{5}x + 2$ perpendicular line equation _____

Answers to Determining the Equation of a line.

1. a) $y = 3(x-2) - 5$

$$y = 3x - 6 - 5$$

$$y = 3x - 11$$

b) $y = -2(x-4) + 3$

$$y = -2x + 11$$

c) $y = 5(x+4)$

$$y = 5x + 20$$

d) $y = -6(x+1) - 2$

$$y = -6x - 8$$

e) $y = 2(x+3) + 6$

$$y = 2x + 12$$

f) $y = \frac{1}{4}(x+2) - 6$

$$y = \frac{1}{4}x + \frac{1}{2} - 6$$

$$y = \frac{1}{4}x - \frac{11}{2}$$

g) $y = -\frac{4}{3}(x-6) - 2$

$$y = -\frac{4}{3}x + 8 - 2$$

$$y = -\frac{4}{3}x + 6$$

h) $y = \frac{1}{2}(x+8) + 1$

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

2a) $l_1: y = 3x + 2$

$l_2: x = -4$

$l_3: y = 2$

$l_4: y = \frac{2}{5}x - 2$

$$2b) \quad l_1: y = \frac{2}{3}x - 3 \quad l_2: y = -4x + 2$$

$$l_3: y = -\frac{1}{3}x - 3$$

Determining Equations of Parallel and Perpendicular Lines.
Part A

$$1. \quad b = 3 \quad m = -3$$

$$y = -3x + 3$$

$$2. \quad b = -7 \quad m = -\frac{1}{4}$$

$$y = -\frac{1}{4}x - 7$$

$$3. \quad m = -3 \text{ thru } (3, -4)$$

$$-4 = -3(3) + b$$

$$-13 = b$$

$$y = -3x - 13$$

$$4. \quad m = -3 \text{ thru } (-5, 6)$$

$$6 = -3(-5) + b$$

$$-9 = b$$

$$y = -3x - 9$$

$$5. \quad m = \frac{5}{2} \text{ thru } (8, -1)$$

$$-1 = \frac{5}{2}(8) + b$$

$$-21 = b$$

$$y = \frac{5}{2}x - 21$$

$$6. \quad m = \frac{1}{4} \text{ thru } \left(\frac{2}{3}, \frac{5}{6}\right)$$

$$\frac{5}{6} = \frac{1}{4}\left(\frac{2}{3}\right) + b$$

$$\frac{5}{6} = \frac{1}{6} + b$$

$$\frac{2}{3} = b$$

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

$$7. \quad m = \frac{1}{5} \quad b = 0$$

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

Part B

Part B - MANY POSSIBLE ANSWERS

