



## Mathematics 52

## Handout 4

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Course ID: (27488) and (27501)

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 - solution -

Note: This handout covers some problems from the Slope of a Line and Equation of a Line.

Problem 1: Find the slope of the line that passes through each pair of points:

Part a:  $(x_1, y_1) = (6, 5)$  and  $(x_2, y_2) = (6, 7)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 5}{6 - 6} = \frac{2}{0} \text{ Undefined}$$

"Vertical Slope"

Part b:  $(x_1, y_1) = (-1, 5)$  and  $(x_2, y_2) = (-2, -5)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 5}{-2 - -1} = \frac{-10}{-1} = \boxed{10}$$

Problem 2: Find the equation of the line with given properties:

A line passes through  $(0, 5)$  and is parallel to the line:  $2x - 3y = -9$ .

Solution

$$l_1: (x_1, y_1) = (0, 5)$$

$$l_2: 2x - 3y = -9$$

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

$\downarrow$                        $\downarrow$   
 $5$                        $?$                        $0$

From  $l_2$ , we have  $2x - 3y = -9$ , and we need to solve for  $y$  as follows:

$$\Rightarrow 2x - 3y = -9 \Rightarrow \frac{2x + 9}{3} = \frac{3y}{3}$$

$$\Rightarrow \frac{2}{3}x + \frac{9}{3} = y \Rightarrow y = \left(\frac{2}{3}\right)x + (3)$$

$\downarrow$                        $\downarrow$   
 $m$                        $b$  and  $y$ -intercept

If  $l_1 \parallel l_2$ , then

$m_1 = m_2$ . This implies that

$$m_1 = m_2 = m = \frac{2}{3}, \text{ so } y - 5 = \frac{2}{3}(x - 0)$$

$$y - 5 = \frac{2}{3}x \Rightarrow y = \frac{2}{3}x + 5$$

← This is the equation of the line



Math is Amazing!!!

Practice + Study = Success

Good Luck

Mohammed Kaabar

