Math Worksheet: Slope (1)

1. Find the slopes of the lines passing through:

   A. (2, 4) and (2, 5)
   \[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 4}{2 - 2} = \frac{1}{0} \] undefined, Vertical line

   B. (0, 9) and (3, 9)
   \[ m = \frac{9 - 9}{3 - 0} = 0 \] Horizontal line

   C. (2/3, 3/2) and (7/3, 1/2)
   \[ m = \frac{\frac{1}{2} - \frac{3}{2}}{\frac{7}{3} - \frac{2}{3}} = -\frac{3}{5} \]

2. Find parameter \( a \) so that the line passing through the points \((a, -3)\) and \((3, -2)\) is perpendicular to the line \(x + y = 8\).

   \[ m_1 : \text{slope of } L_1 : \quad m_1 = \frac{-2 - (-3)}{3 - a} \]

   \[ m_2 : \text{slope of } L_2 : \quad m_2 = -1 \]

   perpendicular: \( m_1 \cdot m_2 = -1 \) \quad \text{solve for } a = 2.

3. Are the lines \(4x + 3y = 0\) and \(8x + 6y = 7\) parallel, perpendicular or neither.

   \[ m_1 : \text{slope of } 4x + 3y = 0 : \quad m_1 = -\frac{4}{3} \]

   \[ m_2 : \text{slope of } 8x + 6y = 7 : \quad m_2 = -\frac{4}{3} \]

   \[ m_1 = m_2 \rightarrow \text{parallel.} \]