Name:

Problem 1: *Consider the line given by this equation:*

$$5x - 2y = 2.$$

What is the slope of this line?

Solution: To find the slope of this line we follow the steps outlined in class:

The first step is to get two points that are on the line. To do this, we begin by picking any two x-values. Let's choose $x = 0$ and $x = 1$. We now compute the y-value that goes with each x-value.

If $x = 0$, plugging in we get:

$$\begin{aligned} 5(0) - 2y &= 2 \\ 0 - 2y &= 2 \\ -2y &= 2 \\ y &= -1. \end{aligned}$$

Therefore one point on the line is $(0, -1)$.

If $x = 1$, plugging in we get:

$$\begin{aligned} 5(1) - 2y &= 2 \\ 5 - 2y &= 2 \\ -2y &= -3 \\ y &= \frac{-3}{-2} \\ y &= \frac{3}{2}. \end{aligned}$$

Therefore another point on the line is $(1, \frac{3}{2})$.

The second step is to plug our points into the formula for slope. We choose $(x_1, y_1) = (0, -1)$ and $(x_2, y_2) = (1, \frac{3}{2})$. We get

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{\frac{3}{2} - (-1)}{1 - 0} \\ &= \frac{\frac{3}{2} + 1}{1} \\ &= \frac{3}{2} + \frac{2}{2} \\ &= \frac{5}{2}. \end{aligned}$$

The slope is $\frac{5}{2}$.