Graphing Linear Functions

1. A function has $m = \frac{2}{1}$ and passes through (0, –8).
   a) Identify the slope and y-intercept.
   b) Build the formula $y = mx + b$.
   c) Sketch the line using the coordinate and slope provided.

2. A function has slope $m = -3$ and passes through (0, 7).
   a) Identify the slope and y-intercept.
   b) Build the formula $y = mx + b$.
   c) Sketch the line using the coordinate and slope provided.

3. A function has slope $m = \frac{1}{2}$ and passes through (2, –5).
   a) Sketch the line using the coordinate and slope provided.
   b) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   c) Algebraically find the equation $y = mx + b$.
   d) Identify the slope and y-intercept.

4. A line passes through (–2, –5) with slope $m = 4$.
   a) Sketch the line using the coordinate and slope provided.
   b) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   c) Algebraically find the equation $y = mx + b$.
   d) Identify the slope and y-intercept.

5. A line passes through (6, 1) with slope $m = \frac{-2}{3}$.
   a) Sketch the line using the coordinate and slope provided.
   b) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   c) Algebraically find the equation $y = mx + b$.
   d) Identify the slope and y-intercept.

6. A line passes through (7, –5) with slope $m = \frac{-1}{4}$.
   a) Sketch the line using the coordinate and slope provided.
   b) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   c) Algebraically find the equation $y = mx + b$.
   d) Identify the slope and y-intercept.

7. A line passes through $(-3, -3)$ and $(3,5)$.
   a) Sketch the line using the two coordinates provided.
   b) Determine the slope using rise and run.
   c) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   d) Algebraically rearrange the equation into $y = mx + b$.

8. A function travels through (–2, 5) and (4, -4).
   a) Sketch the line using the two coordinates provided.
   b) Find the slope m using the rise and run.
   c) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   d) Algebraically find the equation $y = mx + b$.

9. A line passes through $(-3,2)$ and $(5,-1)$.
   a) Sketch the line using the two coordinates provided.
   b) Determine the slope using rise and run.
   c) Write the equation in point-slope form $y - y_1 = m(x - x_1)$.
   d) Algebraically rearrange the equation into $y = mx + b$.
   e) Identify the y-intercept.

10. Two students use different points from Question 7 to write the equation of the same line.

$$\text{Student A: } y + 3 = \frac{4}{3}(x + 3)$$

$$\text{Student B: } y - 5 = \frac{4}{3}(x - 3)$$

   a) Algebraically rearrange both equations into $y = mx + b$.
   b) Determine whether the students have described the same line.
   c) Explain why different point-slope equations can represent the same function.