MATH 020 Support 4: Graphs of Linear Equations

Linear Equation in Two Variables

\[ Ax + By = C \quad \text{Standard Form of a Line} \]
\[ y = mx + b \quad \text{Slope-Intercept Form} \]

The Slope of a Line

\[
\text{slope} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{rise}}{\text{run}}
\]

The slope of a line passing through two points \((x_1, y_1)\) and \((x_2, y_2)\) is

\[
m = \frac{y_2 - y_1}{x_2 - x_1}
\]

- The slope of a horizontal line: \(m = 0\)
- The slope of a vertical line: \(m = \text{undefined}\)

Intercepts

The \text{x-intercept} is the point where the graph intersects the \(x\)-axis. The \text{y-intercept} is the point where the graph intersects the \(y\)-axis.

To find the \text{x-intercept}, let \(y = 0\) and solve for \(x\).

To find the \text{y-intercept}, let \(x = 0\) and solve for \(y\).
Problems

Find the slope and y-intercept of the line and then graph.

1. \( y = 2x - 8 \)

2. \( y = \frac{1}{4}x - 2 \)

3. \( y = 8x - 9 \)

4. \( x = -3 \)

5. \( y = 7 \)

Graph the equation by first finding the x and y intercepts.

6. \( 3x + 4y = 12 \)
7. \(3x - 2y = 6\)

8. \(y = 1.2x - 3.5\)