Review Exercise Set 9

Exercise 1: Write the given linear equation in slope-intercept form. State the slope and y-intercept of the linear equation.

\[ 7x + 3y - 8 = 0 \]

Exercise 2: Determine the slope and y-intercept in the given linear equation. Graph the line using the y-intercept and slope.

\[ 7x = 5y + 20 \]
Exercise 3: Determine the slope and equation of the line in given graph.

Exercise 4: Write the equation of the line, with the given properties, in slope-intercept form.

\[ m = -\frac{1}{6} \text{ and } p = (-6, 5) \]
Exercise 5: Write the equation of the line, with the given properties, in standard form.

\[ p = (-2, 4) \] and perpendicular to \( y = \frac{1}{5}x + 1 \)
Review Exercise Set 9 Answer Key

Exercise 1: Write the given linear equation in slope-intercept form. State the slope and y-intercept of the linear equation.

\[ 7x + 3y - 8 = 0 \]

\[ 3y = -7x + 8 \]

\[ y = -\frac{7}{3}x + \frac{8}{3} \]

slope (m) = \(-\frac{7}{3}\) and the y-intercept \((0, b) = (0, \frac{8}{3})\)

Exercise 2: Determine the slope and y-intercept in the given linear equation. Graph the line using the y-intercept and slope.

\[ 7x = 5y + 20 \]

First, rewrite the equation into slope-intercept form

\[ 7x - 20 = 5y \]

\[ \frac{7}{5}x - 4 = y \]

\[ y = \frac{7}{5}x - 4 \]

slope (m) = \(\frac{7}{5}\) and the y-intercept \((0, b) = (0, -4)\)
Exercise 2 (Continued):

Now, plot the intercept and use the slope to plot additional points

\[ m = \frac{7}{5} = \frac{-7}{-5} = \frac{\text{rise}}{\text{run}} \]
Exercise 3: Determine the slope and equation of the line in given graph.

From the graph determine the rise and run between the points

\[ \text{rise} = -3 \]
\[ \text{run} = 1 \]

\[ m = \frac{\text{rise}}{\text{run}} = \frac{-3}{1} = -3 \]

Now substitute the slope and the y-intercept into the slope-intercept form of a line.

\[ m = -3 \text{ and y-intercept } = (0, 4) \]

\[ y = mx + b \]
\[ y = -3x + 4 \]

Exercise 4: Write the equation of the line, with the given properties, in slope-intercept form.

\[ m = -\frac{1}{6} \text{ and } p = (-6, 5) \]

Since we are not given the y-intercept use the point-slope form of a line to determine the equation of the line. Point p will be \((x_1, y_1)\)
Exercise 4 (Continued):

\[ y - y_1 = m(x - x_1) \]
\[ y - 5 = \frac{1}{6}(x - (-6)) \]
\[ y - 5 = \frac{1}{6}(x + 6) \]
\[ y - 5 = \frac{1}{6}x - 1 \]
\[ y = \frac{1}{6}x - 1 + 5 \]
\[ y = \frac{1}{6}x + 4 \]

Exercise 5: Write the equation of the line, with the given properties, in standard form.

\[ p = (-2, 4) \text{ and perpendicular to } y = \frac{1}{5}x + 1 \]

First, determine the slope of the given line

\[ m_1 = \frac{1}{5} \]

Next, determine the perpendicular slope \( (m_2) \)

\[ m_1 \times m_2 = -1 \]
\[ \frac{1}{5} \times m_2 = -1 \]
\[ m_2 = -5 \]

Now, substitute \( p \) as \( (x_1, y_1) \) and \( m_2 \) as \( m \) into the point-slope form to find the equation of the line

\[ (x_1, y_1) = (-2, 4); m = -5 \]
\[ y - y_1 = m(x - x_1) \]
\[ y - 4 = -5(x + 2) \]
\[ y - 4 = -5x - 10 \]
\[ y - 4 + 5x + 10 = 0 \]
\[ 5x + y + 6 = 0 \]