Writing Rules (Equations) – Worksheet #8

Write a rule (equation) for each. Remember the two pieces of information you’ll need before you can write that equation!!

1) \( y = -\frac{1}{3}x + 3 \)

\[
\begin{array}{c|c}
\text{x} & \text{y} \\
0 & -11 \\
5 & -8 \\
10 & -5 \\
\end{array}
\]

\[
m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 - (-11)}{5 - 0} = \frac{3}{5}
\]

2) \( y = \frac{2}{3}x - 6 \)

\[
\begin{array}{c|c}
\text{x} & \text{y} \\
0 & -6 \\
6 & 8 \\
4 & 7 \\
\end{array}
\]

\[
m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 9}{6 - 0} = \frac{-1}{2}
\]

3) \( y = \frac{3}{5}x - 11 \)

4) \( y = \frac{1}{2}x + 5 \)

Write a rule (equation) for each line when given the slope and a point that the line passes through.

5) has a slope of -5, and passes through (2, -7)

\[
y = mx + b \\
-7 = -5 \cdot 2 + b \\
-7 = -10 + b \\
+10 +10 \\
3 = b
\]

\( y = -5x + 3 \)

6) has a slope of \(\frac{1}{3}\), and passes through (-9, 2)

\[
y = mx + b \\
2 = \frac{1}{3} \cdot (-9) + b \\
2 = -3 + b \\
+3 +3 \\
5 = b
\]

\( y = \frac{1}{3}x + 5 \)
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Write a rule (equation) for the line passing through the given points.

7) passes through (2, -5) and (-1, 1)
   \[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - (-1)}{2 - (-1)} = \frac{6}{3} = 2 \]
   \[ y = mx + b \]
   \[ y = 2x - 1 \]

8) passes through (4, -6) and (6, -5)
   \[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - (-6)}{6 - 4} = \frac{1}{2} \]
   \[ y = mx + b \]
   \[ y = \frac{1}{2}x - 8 \]

9) passes through (2, -5) and (7, 5)
   \[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - (-5)}{7 - 2} = \frac{10}{5} = 2 \]
   \[ y = mx + b \]
   \[ y = 2x - 9 \]

10) passes through (7, -11) and (4, 1)
    \[ m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-11)}{4 - 7} = \frac{12}{-3} = -4 \]
    \[ y = mx + b \]
    \[ y = -4x + 17 \]