EXAMPLE 1: CALCULATE INTERCEPTS:

Joanne loves reading. She has $48 to spend at her favourite used book store. She likes comic books, which cost $4 each; and novels, which cost $6 each. What combinations of comic books and novels can Joanne buy?

Let's model this with an equation:

\[ x - \text{number of comic books} \]
\[ y - \text{number of novels} \]

Equation: \[ 4x + 6y = 48 \]

\[ \text{a) Determine the x- and y-intercepts of the equation } 4x + 6y = 48 \]

To find the x intercept, let \( y = 0 \) and solve for \( x \):

\[
\begin{align*}
4x + 6(0) &= 48 \\
4x &= 48 \\
x &= \frac{48}{4} \\
x &= 12
\end{align*}
\]

\((12, 0)\) point #1

To find the y intercept, let \( x = 0 \) and solve for \( y \):

\[
\begin{align*}
4(0) + 6y &= 48 \\
6y &= 48 \\
y &= \frac{48}{6} \\
y &= 8
\end{align*}
\]

\((0, 8)\) point #2

\[ \text{b) Use the intercepts to graph the line.} \]

EXAMPLE 2: USING INTERCEPTS TO GRAPH A LINE:

For each linear relation, determine the x- and y-intercepts and graph the line.

a) \( 2x - y = 7 \)
   - Find the x-intercept:
     \[
     \begin{align*}
     2x - 0 &= 7 \\
     2x &= 7 \\
x &= \frac{7}{2}
     \end{align*}
     \]

     \((\frac{7}{2}, 0)\) point #1

   - Find the y-intercept:
     \[
     \begin{align*}
     2(0) - y &= 7 \\
     -y &= 7 \\
y &= -7
     \end{align*}
     \]

     \((0, -7)\) point #2