**Common Math 10**  
*Lesson 6.6 ~ General Form of the Equation for a Linear Function*

**General form** is the third of three forms of an equation for a linear function that we will look at.

\[ Ax + By + C = 0 \]

To write any equation of a line in standard form:
1. Move everything to one side.
2. Multiply by the common denominator to eliminate any fractions (or decimals).
3. Multiply or divide to make \( A \) positive.

*Standard form* is also sometimes used; it is very similar to general form except that the constant is on the other side of the equation.

\[ Ax + By = -C \]

**Example #1:** Write each of the following in general form.

a) \( y = -\frac{1}{4}x + 3 \)

\[
\begin{align*}
(y &= -\frac{1}{4}x + 3) \times 4 \\
4y &= -x + 12 \\
-x - 12 + x &= 12 \\
x + 4y - 12 &= 0
\end{align*}
\]

b) \( y + 2 = \frac{3}{2}(x - 4) \)

\[
\begin{align*}
(y + 2 &= \frac{3}{2}x - 6) \times 2 \\
2y + 4 &= 3x - 12 \\
-2y - 4 &= -2y - 4 \\
0 &= 3x - 2y - 16
\end{align*}
\]
To graph a line in general form:
- Isolate the $y$ to write in slope-intercept form, and then graph, or
- Find the $x$ and $y$ intercepts and graph these.

Example #2: Graph the equation $x + 3y + 9 = 0$ using two methods.

Method 1: write in slope-intercept form to graph

\[
\begin{align*}
&x + 3y + 9 = 0 \\
&-x - 9 = -3y \\
&y = -\frac{1}{3}x - 3
\end{align*}
\]

Method 2: calculate intercepts to graph

$x$-int $\Rightarrow$ make $y = 0$

\[
\begin{align*}
x + 3(0) + 9 &= 0 \\
x + 9 &= 0 \\
-x &= -9 \\
x &= -9 \Rightarrow (-9, 0)
\end{align*}
\]

$y$-int $\Rightarrow$ make $x = 0$

\[
\begin{align*}
0 + 3y + 9 &= 0 \\
3y &= -9 \\
y &= -3 \Rightarrow (0, -3)
\end{align*}
\]