**Graphing Lines**

**Slope-Intercept form of equation:**

\[ y = mx + b \]

\( m \) : slope  \( b \) : \( y \)-intercept

Note that it is in the form of \( y = \) __________

**Ex.** Given \( y = \frac{2}{5}x - 1 \)

1. **Table method:** pick good \( x \)-values
   (if there is a fraction for slope, pick the denominator)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y = \frac{2}{5}x - 1 )</th>
<th>( (x, y) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>\frac{2}{5}(-5) - 1</td>
<td>(-5, -3)</td>
</tr>
<tr>
<td>0</td>
<td>\frac{2}{5}(0) - 1</td>
<td>(0, -1)</td>
</tr>
<tr>
<td>5</td>
<td>\frac{2}{5}(5) - 1</td>
<td>(5, 1)</td>
</tr>
</tbody>
</table>

Plot

2. **Slope-intercept method:** \( m = \frac{2}{5}, \ b = -1 \)
   - Start at \((0, b)\)
   - Move according to slope \( \frac{\text{rise (up/down)}}{\text{run (left/right)}} \)
   - Plot

   \* Start at \((0, -1)\)
   \* Slope is \( \frac{2}{5} \Rightarrow \) move up 2, right 5

**General form of line:**

\[ ax + by = c \]

(Note that \( x \) and \( y \) terms are on the same side, \( d = \) sign)

**Ex.** \( 2x + 3y = 6 \)

1. **Intercepts method**
   (not always the most straightforward because coordinates might be fractions)
   - Find \( x \)-int by setting \( y = 0 \)
     \( \Rightarrow (x, 0) \)
     \( 2x + 3(0) = 6 \)
     \( 2x = 6 \)
     \( x = 3 \Rightarrow (3, 0) \)
   - Find \( y \)-int by setting \( x = 0 \)
     \( 2(0) + 3y = 6 \)
     \( 3y = 6 \)
     \( y = 2 \Rightarrow (0, 2) \)

Plot

2. **Change to \( y = mx + b \) by solving for \( y \) a plot using slope-intercept method.**

\[ 2x + 3y = 6 \]
\[ -2x \]
\[ \frac{3y}{3} = \frac{-2x + 6}{3} \]
\[ y = -\frac{2}{3}x + 2 \]

\( m = -\frac{2}{3} \Rightarrow \) move down 2, right 3

\( y \)-int = \((0, 2)\)