Type of lines:

1) Vertical  
   \[ x = a \]

2) Horizontal  
   \[ y = b \]

3) Slant
   \[ Ax + By = C \]
   \[ y = mx + b \]
   \[ y - y_1 = m(x - x_1) \]

Standard Form
Slope-Int. Form
Point-Slope Form
Graph $x = 4$

$x$-only $\Rightarrow$ Vertical line

Graph $x = -2$, and shade to its left.

$x$-only $\Rightarrow$ Vertical line
Graph \( x = -5 \) and \( x = 6 \), then shade the region between them.

\[ x = -5 \quad \text{Vertical line} \]
\[ x = 6 \quad \text{Vertical line} \]

Draw \( y = 2 \)

\( y \)-only \( \leftrightarrow \) Horizontal line

Draw \( y = -5 \), shade the region above it.
Graph \( x = -6 \) and \( y = 4 \) in the same coordinate system. Clearly mark their intersection point, and label it.

\[ x = -6 \]

Vertical line (V.L.)

\[ y = 4 \]

Horizontal line (H.L.)

Slant line: Standard Form

\[ 3x - 4y = 12 \]

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Intercept Method
use the intercept method to graph

\[5x + 2y = 10\]

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

\[5x + 2y = 10\]

Graph \(2x - y = -8\) by intercept method, then shade below it.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>-4</td>
<td>0</td>
</tr>
</tbody>
</table>

\[2x - y = -8\]

\[x = 0\]
\[2 \cdot (0) - y = -8\]
\[-y = -8\]
\[y = 8\]

\[y = 0\]
\[2x - y = -8\]
\[2x = -8\]
\[x = -4\]
Graph \( x - 3y = -6 \), \( x = 4 \), and \( y = -3 \) in the same coordinate system. Then shade the region enclosed by all three lines.

\( x = 4 \) \( \leftrightarrow \) V.L.
\( y = -3 \) \( \leftrightarrow \) H.L.
\( x - 3y = -6 \)

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>2</th>
<th>-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Slant line: Slope-Int. Form \( y = mx + b \)

\[ m = \frac{\text{Rise}}{\text{Run}} \]
\[ y = \text{Int} \]

Ex:
\[ y = \frac{2}{3}x + 4 \]
\[ m = \frac{2}{3}, \quad \text{Int} (0, 4) \]

Ex:
\[ y = -\frac{5}{3}x - 4 \]
\[ m = -\frac{5}{3}, \quad \text{Int} (0, -4) \]
Graph \[ y = \frac{3}{4}x - 3 \]
Slope \[ m = \frac{3}{4} \]
Y-Intercept \( (0, -3) \)

Graph \[ y = -\frac{5}{2}x + 5 \]
Slope \[ m = -\frac{5}{2} \]
Y-Intercept \( (0, 5) \)
Graph both lines below in the same coordinate system:

\[ y = \frac{-2}{3}x + 2 \]
\[ y = \frac{3}{2}x + 2 \]
Y-Int (0,2)

\[ y = \frac{-3}{5}x + 6 \]
\[ m = \frac{-3}{5} \frac{\text{rise}}{\text{run}} \]
Y-Int (0,6)

\[ y = \frac{-3}{5}x - 4 \]
\[ m = \frac{-3}{5} \frac{\text{rise}}{\text{run}} \]
Y-Int (0,-4)
Slant line: Point-Slope Form

\[ y - y_1 = m(x - x_1) \]

Slope \( m \)

Point \((x_1, y_1)\)

Ex:

\[ y - 6 = \frac{1}{2}(x - 4) \]

Slope \( m = \frac{1}{2} \)

Point \((4, 6)\)

\[ y + 8 = \frac{-2}{3}(x - 1) \]

Slope \( m = \frac{-2}{3} \)

Point \((1, -8)\)

Ex:

\[ y - 10 = 4(x + 3) \]

Slope \( m = 4 \)

Point \((3, 10)\)

Rise & Run \( \frac{4}{1} \) Rise \( \frac{4}{1} \) Run \( 1 \)

\[ y = -5(x - 4) \]

Slope \( m = -5 \)

Point \((4, 0)\)

Rise & Run \( -5 = \frac{-5}{1} \) Rise \(-5\) Run \(1\)

Go to [www.my.mathclasses.com](http://www.my.mathclasses.com) one word

then click on Math 125

Ignore everything except Study Guide 1

Print it, work on it.