Warm up Problems

1. Solve the following equation for \( y \):
\[
2x + 3y = 9
\]

2. Graph \( y = -\frac{2}{3}x + 3 \) using the slope and \( y \)-intercept.

3. What is the \( y \)-intercept of the line in 2.?
5.1 Equations of the form $Ax + By = C$

The equation $Ax + By = C$ where $A, B$ and $C$ are numbers is also a linear equation. It is called a **General Linear Equation**.

Examples: $2x - 3y = 6$  $3x + 5y = 10$
Graphing lines in $Ax+By=C$ form

Method 1: Graph using the intercepts.

Recall:

- The $x$-intercept is the point $(a,0)$ where the line crosses the $x$-axis.
- The $y$-intercept is the point $(0,b)$ where the line crosses the $y$-axis.

To find the $x$-intercept, we set $y = 0$ and solve.

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Examples:
1. Given $5x-2y=10$
   a. Find the x-intercept
   b. Find the y-intercept
   c. Sketch the graph of the equation

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Do: Given $4x-5y=20$
   a. Find the x-intercept
   b. Find the y-intercept
   c. Graph the equation

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Method 2: Writing the line in $y=mx+b$ form

Examples:
1. Given $5x-2y=10$
   a. Find the slope and y-intercept
   b. Graph the line

Do. Given $4x-5y-20=0$
   a. Find the slope and y-intercept
   b. Graph the line
Before we can use the y-intercept and slope to graph a linear equation, we must write the equation as
\[ y = mx + b \]

**Special Cases**

Find the slope and the y-intercept and graph

1. \[ 4x - 6y = 0 \]

2. \[ y + 5 = 0 \]