3.1 Linear Equations

Equations of the form \( y = mx + b \):

Examples:
- \( y = -2x + 3 \)
- \( y = x - 5 \)

Def: An ordered pair \((a, b)\) is a **solution** of an equation if the equation is true when we substitute \(a\) for \(x\) and \(b\) for \(y\).

We say: “\((a, b)\) satisfies the equation”

Solution set: set of all solutions
Examples:
1. Is (2, 1) a solution of $y=3x-5$?

2. Is (4, 9) a solution of $y=3x-5$?
A graph of an equation is the set of all points that are solutions of the equation.

Example: Sketch a graph of \( y = -2x + 3 \)

1. Make a table of solutions:

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<th>x</th>
<th>y</th>
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2. Graph the solutions on a set of axes

3. What are the coordinates of the \( y \)-intercept?
The graph of an equation of the form $y=mx+b$ is a line.

The y-intercept of the graph of $y=mx+b$ is $(0,b)$.
Getting solutions from the graph: Example: The graph of a line is sketched below.

1. Find y when x = 2.

2. Find x when y = -1

3. Create a table of ordered pairs for this line. Include at least 5 ordered pairs.