

# Chapter 0-0: Linear Equations

## Objectives

1. Define and solve linear equations
- 2. Use the distance, midpoint, and slope formulas
3. Identify and write equations in slope-intercept form

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## General Form of a Linear Equation

$$Ax + By = C$$

Handwritten annotations: "Numbers" with arrows pointing to A, B, and C; "power of 1" with an arrow pointing to the x in Ax.

### EXAMPLES

$$3x + 5y = 10$$

$$y = 10x + 5$$

$$y = -\frac{5}{2}x + 3$$

### NON-EXAMPLES

$$y = x^2 + 5x + 10$$

$$y = \frac{1}{x} = x^{-1}$$

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## Solving Linear Equations

Ex 1:

$$5x + 10 = 0$$

Handwritten annotations: a circle around 10, and -10 written below 10 and 0.

$$\frac{5x}{5} = \frac{-10}{5}$$

$$x = -2$$

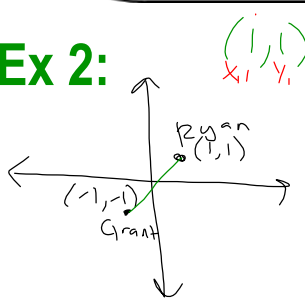
Handwritten annotation: a circle around the final answer x = -2.

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## The Distance Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Ex 2:



$$\sqrt{4} \quad \sqrt{4}$$

$$d = \sqrt{(-2)^2 + (-2)^2}$$

$$d = \sqrt{4 + 4}$$

$$d = \sqrt{8} \approx 2.83$$

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## Midpoint Formula

$$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Ex 3:  $(2, 2)$   $(-7, -9)$

$$M = \left( -\frac{5}{2}, -\frac{7}{2} \right)$$

$$(-2.5, -3.5)$$

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# Slope Formula

$$\frac{\text{RISE } \Delta Y}{\text{RUN } \Delta X}$$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

**Ex 4:**

$$\frac{(5, 4) - (-3, -2)}{8} = \frac{6}{8} = \frac{3}{4}$$

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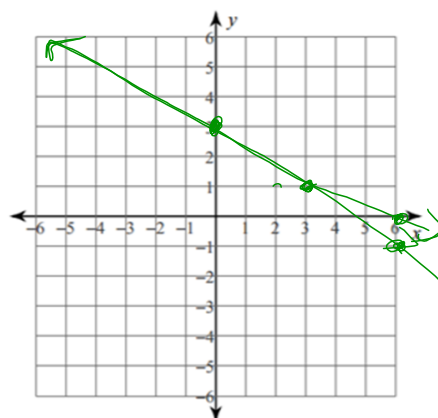
# Slope-Intercept Form

$$y = mx + b$$

↑ slope      ↑ y-int

**Ex 5:**

$$y = -\frac{2}{3}x + 3$$



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# Homework

## 0-0 Worksheet #1

Aug 18-12:09 PM

Aug 19-9:32 AM