Substitution Method
Two Ways to Solve Problems

Method 1: Using Substitution by Setting Equations Equal to Each Other

When both equations are written in slope-intercept form, set them equal to each other to solve. Think Break-Even Problems!

$$\begin{cases} y = -4x + 8 \\ y = x + 7 \end{cases}$$

Step 1: Write an equation containing only 1 variable and solve it.

$y = -4x + 8$

$x + 7 = -4x + 8$

$x + 4x + 7 = 8$

$5x + 7 = 8$

$5x = 8 - 7$

$5x = 1$

$x = 0.2$

Step2: Solve for the other variable in either equation.

$y = 0.2 + 7$

$y = 7.2$

The solution is $(0.2, 7.2)$

Method 2: Using Substitution and the Distributive Property

$$\begin{cases} 3y + 2x = 4 \\ -6x + y = -7 \end{cases}$$

Step 1: Solve the second equation for *y* because it has a coefficient of **1**.

$-6x + y = -7$

$y = 6x - 7$

Step 2: Write an equation containing only 1 variable and solve it.

$3y + 2x = 4$

$3(6x - 7) + 2x = 4$

$18x - 21 + 2x = 4$

$20x - 21 = 4$

$20x = 4 + 21$

$20x = 25$

$x = 1.25$

Step 3: Solve for the other variable in either equation.

$-6(1.25) + y = -7$

$-7.5 + y = -7$

$y = -7 + 7.5$

$y = 0.5$

The solution is $(1.25, 0.5)$