Method 2: Substitution

This is an algebraic method!

SUBSTITUTION:

Single out x or y and create a blob.

x = _____ or

y = _____

Substitution means we are going to replace the variable with whatever it is equal to.

Watch me...

$2y + x = -15$

$x = 3y$

$2y + 3y = -15$ CLT on S.S.

$\frac{5y}{5} = \frac{-15}{5}$ I.O.

$y = -3$

$x = 3y$

$x = 3(-3)$

$x = -9$

$(-9, -3)$

Let's do this one together

$4x + 7y = 19$

$y = x + 9$

$4x + 7(x+9) = 19$

$4x + 7x + 63 = 19$

$11x + 63 = 19$

$-63 = -63$

$\frac{11x}{11} = \frac{-44}{11}$

$x = -4$

$y = (-4) + 9$

$y = 5$

$(-4, 5)$

You try

$2x - 8y = 6$

$y = -7 - x$

$2x - 8(-7 - x) = 6$

$2x + 56 + 8x = 6$

$10x + 56 = 6$

$-56 \quad -56$

$\frac{10x}{10} = \frac{-50}{10}$

$x = -5$

$y = -7 + (+5)$

$y = -2$

$(+5, -2)$

Last one!

$-7x - 2y = -13$

$x - 2y = 11$

$+2y \quad +2y$

$x = 11 + 2y$

$-7(11 + 2y) - 2y = -13$

$-77 - 14y - 2y = -13$

$-77 \quad -16y = -13 \quad +77$

$\frac{-16y}{-16} = \frac{64}{-16}$

$y = -4$

$x = 11 + 2(-4)$

$x = 11 - 8$

$x = 3$

$(3, -4)$

Word Problems: The Fun Stuff!

For each problem you will need to...

a. **Define the variables in WORDS. (Let x = … Let y =…)**
b. Write the system of equations
c. Use substitution/graphing to solve: SHOW WORK
d. State your solution in sentence form.

Example 1

Last season two running backs on the Steelers football team rushed for a combined total of 1550 yards. One rushed 4 times as many yards as the other. How many yards were rushed by each player?

Example 2

A particular Algebra text has a total of 1382 pages which is broken into two parts. The second part of the book has 64 more pages than the first part. How many pages are in each part of the book.

Example 3

Dennis mowed his next door neighbor's lawn for a handful of dimes and nickels, 80 coins in all. Upon completing the job he counted out the coins and it came to $6.60. How many of each coin did he earn?

Example 4

On Monday Joe bought 10 cups of coffee and 5 doughnuts for his office at the cost of $16.50. It turns out that the doughnuts were more popular than the coffee. On Tuesday he bought 5 cups of coffee and 10 doughnuts for a total of $14.25. How much was each cup of coffee?