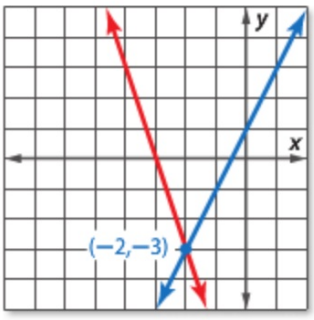
Algebra 1 6.2

Solve systems of equations using substitution method

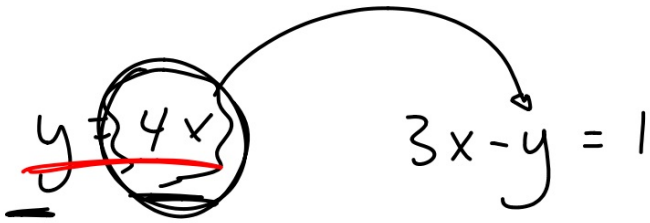
Solve problems using substitution of equations

solve
solve by graphing
substitution
substitution method

activity: cut & paste
whiteboards



Cut & paste activity



the same

$(-1, -4)$

$y = 4x$

$y = 4 \cdot -1$

$y = -4$

$3x - 4x = 1$

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

$x = -1$

MUST show work for credit!

You are the coach...
Who is on the sub list?

Example 1 Solve a System by Substitution

Use substitution to solve the system of equations.

$y = 2x + 1$
$3x + y = -9$

Step 1 The first equation is already solved for y.

$y = 2x + 1$

$3x + y = -9$

$3x + 2x + 1 = -9$

$5x + 1 = -9$

$-1 \quad -1$

$5x = -10$

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

$x = -2$

$y = 2 \cdot -2 + 1$

$= -4 + 1$

$= -3$

$(-2, -3)$

KeyConcept Solving by Substitution

Step 1 When necessary, solve at least one equation for one variable.

Step 2 Substitute the resulting expression from Step 1 into the other equation to replace the variable. Then solve the equation.

Step 3 Substitute the value from Step 2 into either equation, and solve for the other variable. Write the solution as an ordered pair.

GuidedPractice

1A. $y = 4x - 6$
$5x + 3y = -1$

$y = 4x - 6$ $\qquad 5x + 3y = -1$

$5x + 3(4x - 6) = -1$

$5x + 12x + {}^{-}18 = -1$

$17x + {}^{-}18 = -1$

$+18 \quad +18$

$\frac{17x}{17} = \frac{17}{17}$

$x = 1$

$y = 4 \cdot 1 + {}^{-}6$

$y = -2$

$(1, {}^{-}2)$

1B. $2x + 5y = -1$
$y = 3x + 10$

$y = 3x + 10$ $\quad 2x + 5y = -1$

$y = 3 \cdot -3 + 10$
$= -9 + 10$

$(-3, 1)$

$2x + 5(3x + 10) = -1$
$2x + 15x + 50 = -1$
$17x + 50 = -1$
$-50 \quad -50$
$\frac{17x}{17} = \frac{-51}{17}$

How is this problem different?

$y =$ $x =$

Example 2 Solve and then Substitute

Use substitution to solve the system of equations.

$x + 2y = 6$

$3x - 4y = 28$

$X + 2y = 6$

$-2y \quad -2y$

$x = -2y + 6$

$X = -2 \cdot -1 + 6$

$X = 2 + 6$

$(8, -1)$

$3x + -4y = 28$

$3(-2y + 6) + -4y = 28$

$-6y + 18 + -4y = 28$

$-10y + 18 = 28$

$-18 \quad -18$

$-10y = 10$

$\frac{-10y}{-10} = \frac{10}{-10}$

$y = -1$

Guided Practice

2A. $4x + 5y = 11$

$y - 3x = -13$

$+3x \quad +3x$

$y = 3x + -13$

$3 \cdot 4 + -13$

$12 + -13$

$(4, -1)$

$4x + 5y = 11$

$4x + 5(3x + -13) = 11$

$4x + 15x + -65 = 11$

$19x + -65 = 11$

$+65 \quad +65$

$\frac{19x}{19} = \frac{76}{19}$

$x = 4$

28. $x - 3y = -9$

$5x - 2y = 7$