Algebra 1   6.2
Solve systems of equations using substitution method
Solve problems using substitution of equations
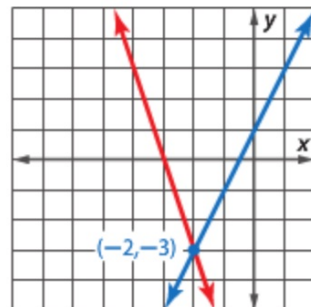
solve
solve by graphing
substitution – replace with something =
substitution method

activity: cut & paste
whiteboards

Are there ever any complications when solving by graphing?

recipe: if you run out of one ingredient...
coach: two players are equally skilled...

Cut & paste activity

$$y = 2x$$

$$x + y = 6$$

$$y = 2 \cdot 2$$
$$y = 4$$

$$(2, 4)$$

$$y = 4x + 5 \qquad 2x + y = 17$$

$$y = 4 \cdot 2 + 5 \qquad 6x + 5 = 17$$
$$= 8 + 5 \qquad \underline{ -5 \quad -5}$$

$$(2, 13) \qquad \frac{6x}{6} = \frac{12}{6}$$
$$x = 2$$

$$y = \boxed{3x - 2}$$

$$y = 3 \cdot {}^-3 + {}^-2$$
$$= {}^-9 + {}^-2$$

$$({}^-3, {}^-11)$$

$$2x - y = 5$$

$$2x + {}^-1(3x - 2) = 5$$

$$2x - 3x + 2 = 5$$

$$-x + 2 = 5$$
$$ {}^-2 \quad {}^-2$$

$$\frac{-x}{{}^-1} = \frac{3}{{}^-1} \qquad x = {}^-3$$

$$y = x + 3 \qquad\qquad x + y = 9$$

$$y = 3 + 3 \qquad\qquad 2x + 3 = 9$$
$$y = 6$$

$$(3, 6)$$

Example 1 Solve a System by Substitution

Use substitution to solve the system of equations.

$y = 2x + 1$ ← **Step 1** The first equation is already solved for y.
$3x + y = -9$

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

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.

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

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

How is this problem different?

Use substitution to solve the system of equations.

$x + 2y = 6$
$3x - 4y = 28$

GuidedPractice

2A. $4x + 5y = 11$
$y - 3x = -13$

2B. $x - 3y = -9$
$5x - 2y = 7$