Algebra 1   6.3
Solve systems of equations by elimination
system of equations
solve
substitution method
zero pair
additive inverse
addition property of equality
whiteboards

form zero pairs

$-4 \cdot 0 + 3 \cdot -1 = -3$
$0 + -3 = -3$

GuidedPractice

$(0, -1)$ ☺

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

$4x - 5 \cdot -1 = 5$

$4x + 5 = 5$

$\dfrac{-2y}{-2} = \dfrac{2}{-2}$

$\quad -5 \quad -5$

$\dfrac{4x}{4} = \dfrac{0}{4}$

$y = -1$

2. $8x + 5y = 38$
   $-8x + 2y = 4$

$(1, 6)$ ✓

$$\frac{7y}{7} = \frac{42}{7}$$

$$y = 6$$

$$8x + 5 \cdot 6 = 38$$

$$8x + 30 = 38$$

$$\underline{-30 \quad -30}$$

$$\frac{8x}{8} = \frac{8}{8}$$

$$-8 \cdot 1 + 2 \cdot 6 = 4$$

$$-8 + 12 = 4$$

3. Solve the system of equations.

$$8b + 3c = 11$$
$$8b + 7c = 7$$

-1 on first equation

$$-8b + -3c = -11$$
$$8b + 7c = 7$$

$$\frac{4c}{4} = \frac{-4}{4}$$

$$c = -1$$

$$8 \cdot b + 3 \cdot -1 = 11$$
$$8b + -3 = 11$$
$$\underline{+3 \quad +3}$$
$$\frac{8b}{8} = \frac{14}{8}$$

(b, c)

$\left(\frac{7}{4}, -1\right)$

x y

Example 2 Write and Solve a System of Equations

Negative three times one number plus five times another number is −11.
Three times the first number plus seven times the other number is −1.
Find the numbers.

$$-3x + 5y = -11 \qquad (2, -1)$$

$$\longrightarrow 3x + 7y = -1$$

$3x + 7 \cdot -1 = -1 \qquad \dfrac{12y}{12} = \dfrac{-12}{12}$

$3x + -7 = -1$

$\quad +7 \quad +7$

$\dfrac{3x}{3} = \dfrac{6}{3}$

$x = 2$

5. CCSS REASONING The sum of two numbers is 24. Five times the first number minus the second number is 12. What are the two numbers?

$$x + y = 24$$

$(6, 18)$

$$x + y = 24$$
$$5x - y = 12$$

$$6x = 36$$
$$\frac{6x}{6} = \frac{36}{6}$$
$$x = 6$$

$$6 + y = 24$$
$$-6 \qquad -6$$
$$y = 18$$

$$x + y = 41$$
$$x - y = 5$$

Whiteboards

2. $8x + 5y = 38$

$-8x + 2y = 4$

1. $5m - p = 7$

$7m - p = 11$

8. $y + z = 4$
$y - z = 8$

1. $5m - p = 7$

   $7m - p = 11$

3 $7f + 3g = -6$
$7f - 2g = -31$

4. $6a - 3b = 27$
$2a - 3b = 11$