Algebra 1 6.3

Solve systems of equations by elimination

system of equations

solve (x,y) *Where do the two lines intersect?*

substitution method

zero pair

additive inverse

addition property of equality

whiteboards

1-4 Classify:

Consistent

inconsistent

dependent

independent

Quiz 6.1-6.2

$$\begin{array}{r} 5 = 5 \\ +3 \quad +3 \\ \hline 8 = 8 \end{array}$$

addition property
So if they are equal, is it OK to add the same thing to both sides?

5 = 5
x - 6 = 8
3x - 6y = 3

Make zero pairs

Example 1 Elimination Using Addition

Use elimination to solve the system of equations.

$4x + 6y = 32$
$3x - 6y = 3$ ←

$4 \cdot 5 + 6y = 32$
$20 + 6y = 32$
$-20 \quad -20$
$6y = 12$
$\frac{6y}{6} = \frac{12}{6}$
$y = 2$

$(5, 2)$

$3 \cdot 5 - 6 \cdot 2 = 3$
$15 - 12 = 3$
$3 = 3$

$\frac{7x}{7} = \frac{35}{7}$
$x = 5$

Are they equal?
So...OK to add same thing to both sides...

GuidedPractice

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

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

$y = -1$

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

$-4x - 3 = -3$

$+3 \quad +3$

$\frac{-4x}{-4} = \frac{0}{-4}$

$x = 0$

$(0, -1)$

$4 \cdot 0 - 5 \cdot -1 = 5$

$0 + 5 = 5$ ☺

1B. $4y + 3x = 22$
$3x - 4y = 14$

$3x + 4y = 22$
$3x - 4y = 14$

How can I make a zero pair?

Define your variables: x = first number y= second number

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.

$-3x + 5y = -11$

$3x + 7y = -1$

$12y = -12$

$\frac{12y}{12} = \frac{-12}{12}$

$-3 \cdot x + 5 \cdot -1 = -11$

$-3x + -5 = -11$

$+5 \quad +5$

$-3x = -6$

$x = 2$

$(2, -1)$

$-3y + 5x = -11$

$3y + 7x = -1$

Multiplication property of equality
$5 = 5$

GuidedPractice

3. Solve the system of equations.

(b, c)

(, -1)

How can I make a zero pair?

$8b + 3c = 11$

$8b + 7c = 7$

$\xrightarrow{\cdot -1}$ $-8b + -3c = -11$

$8b + 7c = 7$

$4c = -4$

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

$c = -1$

$8 \cdot b + 3 \cdot -1 = 11$

$8b + -3 = 11$

$+3 \quad +3$

$8b = 14$

$\frac{8b}{8} = \frac{14}{8}$

ordered pairs (b, c)

rearrange first

Standardized Test Example 3

Solve the system of equations.

$$2t + 5r = 6$$
$$9r + 2t = 22$$

1. $5m - p = 7$
$7m - p = 11$

Goal: make zero pair

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