Name: Key

Date: 7/8A

Day 5: Which is best?

Which is best? Substitution OR Elimination

Warm-Up: Answer the following questions based on your previous knowledge of solving systems algebraically.

1. Can you solve the following systems of equations using elimination? Why or why not?

Yes! Subtract 4x from both sides and line up like terms.

$4x + 8y = 20$ → $4x + 8y = 20$

$2y = 4x - 30$ → $-4x + 2y = -30$

$-4x \quad -4x$

2. Do you think it is easier to use the substitution or elimination method for the following systems? Justify your answer.

a. $-2x + 3y = -6$

$y = 8 - x$

Substitution because one of the equations is already in y= form.

b. $3x + 2y = 8$

$2x - 2y = 12$

Elimination because the like terms are already lined up and there are additive inverses.

Directions: Solve each system of equations algebraically by using *either* substitution or elimination.

1. $y = 3x + 4$
   $y = -2x + 9$

Substitution

$3x+4 = -2x+9$
$+2x \quad +2x$
$5x+4 = 9$
$-4 \quad -4$
$\frac{5x}{5} = \frac{5}{5}$
$x = 1$

$y = 3x+4$
$y = 3(1)+4$
$y = 3+4$
$y = 7$

$(1, 7)$

2. $3x - 3y = 15$
   $x = 1 + 2y$

Substitution

$3(1+2y) - 3y = 15$
$3+6y-3y=15$
$3+3y=15$
$-3 \quad -3$
$\frac{3y}{3} = \frac{12}{3}$
$y = 4$

$x = 1+2y$
$x = 1+2(4)$
$x = 1+8$
$x = 9$

$(9, 4)$

3. $4x - 3y = 22$
   $-2(2x + 8y = 30)$

Elimination

$4x - 3y = 22$
$+ -4x - 16y = -60$
$\frac{-19y}{-19} = \frac{-38}{-19}$
$y = 2$

$4x + 3y = 22$
$4x - 3(2) = 22$
$4x - 6 = 22$
$+6 \quad +6$
$\frac{4x}{4} = \frac{28}{4}$
$x = 7$

$(7, 2)$