Notes_____ Date_____ Hour____

# Section 3.2 – Substitution and Elimination


Solve the following systems by substitution.

(3, -5)

1. $y = x - 8$
   $3x + y = 4$

$3x + x - 8 = 4$

$4x - 8 = 4$

$4x = 12$

$x = 3$

$y = 3 - 8$

$y = -5$

(12, 3)

2. $x = 4y$
   $x - y = 9$

$4y - y = 9$

$3y = 9$

$y = 3$

$x = 4(3)$

$x = 12$

(9, -12)

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

$3x + 2(-3 - x) = 3$

$3x - 6 - 2x = 3$

$x - 6 = 3$

$x = 9$

$y = -3 - 9$

$y = -12$

(-2, 6)

4. $x + y = 4$ → $y = 4 - x$
   $3x + y = 0$

$3x + 4 - x = 0$

$2x + 4 = 0$

$2x = -4$

$x = -2$

$3(-2) + y = 0$

$-6 + y = 0$

$y = 6$

① isolate one of the variables

② substitute the expression into the other equation

③ solve the resulting equation

④ plug back in and solve for the other variable

Be sure to _isolate_ a variable!!!!!

Solve the following systems by elimination. ★ look for opposites

(4,0)

5. $4x + 3y = 16$
$+\ 2x - 3y = 8$

$6x = 24$

$x = 4$

$2(4) - 3y = 8$
$8 - 3y = 8$
$-8 \quad -8$
$-3y = 0$
$y = 0$

(2,0)

6. $2x - 3y = 4$ ·2 → $4x - 6y = 8$
$-4x + 5y = -8$ → $-4x + 5y = -8$

$-1y = 0$
$y = 0$

$-4x + 5(0) = -8$
$-4x = -8$
$x = 2$

(2,1)

line up!

7. $3x + 2y = 8$
$2y = 12 - 5x$
$+5x \quad +5x$

$(3x + 2y = 8)$ ·-1 → $-3x - 2y = -8$
$5x + 2y = 12$ → $5x + 2y = 12$

$2x = 4$

$x = 2$

$2y = 12 - 5(2)$
$2y = 12 - 10$
$2y = 2$
$y = 1$