

I can solve a system of equations by substitution.

Solving Systems by Substitution II Examples and NOTES

1) $y = -4x$
 $-2x + y = 24$

$-2x + (-4x) = 24$ ← Step 1

$-6x = 24$ ← Step 2
 $x = -4$

$y = -4x$ ← Step 3

$y = -4(-4)$
 $y = 16$
 $(-4, 16)$ ← Step 4

Check:
 $y = -4x$
 $(16) = -4(-4)$
 $16 = 16$ ✓
 $-2x + y = 24$ ← Step 5
 $-2(-4) + (16) = 24$
 $8 + 16 = 24$ ✓

2) $y = x - 7$
 $2x + y = 8$

$2x + (x - 7) = 8$ ← Step 1

$3x - 7 = 8$ ← Step 2
 $3x = 15$

$x = 5$
 $y = x - 7$ ← Step 3

$y = 5 - 7$
 $y = -2$
 $(5, -2)$ ← Step 4

Check:
 $y = x - 7$
 $(-2) = (5) - 7$
 $-2 = -2$ ✓
 $2x + y = 8$ ← Step 5
 $2(5) + (-2) = 8$
 $10 + (-2) = 8$ ✓

3) $2x - 3y = 8$

$y = 5x + 6$

$2x + 3(5x + 6) = 8$

$2x + 15x + 18 = 8$

$-13x + 18 = 8$

$+18 +18$

$-13x = 26$

$-13 -13$

$x = -2$

$y = 5(-2) + 6$
 $y = -10 + 6$
 $y = -4$

(x, y)
 $(-2, -4)$

4) $y = -8x + 40$

$3x + y = 10$

$3x + (-8x + 40) = 10$

$-5x + 40 = 10$

$-40 -40$

$-5x = -30$

$-5 -5$

$x = 6$

$y = -8(6) + 40$

$y = -48 + 40$

$y = -8$

$(6, -8)$

Steps in Solving Systems by Substitution...

- 1) Substitute to make one equation with one variable.
- 2) Solve the equation by UNDOING the order of operations. (Isolate the variable.)
- 3) Substitute your solution back in for your known variable to calculate the second value.
- 4) Write your solution as a coordinate point.
- 5) Check your solution by substituting your solution back into both equations.

OR
 $3(6) + y = 10$
 $18 + y = 10$
 $-18 -18$
 $y = -8$

Solving Systems by Substitution II and Review of Graphing

Solve the following systems of equations using substitution. Don't forget to find the solution for both variables. Put a rectangle around your solution.

1) $y = 5x$
 $2x + -2y = -64$
 $2x + -2(5x) = -64$

2) $y = -6$
 $-5x + 3y = 32$

3) $-3x + 4y = -60$
 $y = 2x$

4) $x = -7y$
 $x - y = -32$
 $-7y + y = -32$

5) $x = y + 6$
 $x + y = 30$

6) $x + 2y = 200$
 $x = y + 50$

Homework is continued 