Quadrilaterals – Solving by Substitution

Notes Section 6.1

Name_____

Solve each system of equations by substitution. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

#1)
x = 7
5y + x = 12

$5y + (7) = 12$

$5y = 5$

$y = 1$

(7, 1)

#2)
y = 9
2x – 4y = -40

$2x - 4(9) = -40$

$2x - 36 = -40$

$2x = -4$

$x = -2$

(-2, 9)

#3)
y = 3x – 2
3x – y = 7

$3x - (3x - 2) = 7$

$3x - 3x + 2 = 7$

$2 \neq 7$

NO Solution

PRO TIPS

If possible you may want to transform one or both of your equations. Such as getting rid of fractions or decimals.

#1) In one of the equations, solve for a variable.

#2) Then substitute for the variable into the other equation.

#3) Solve the equation.

#4) Then substitute the value of the variable into one of the equations and solve.

If at any point while solving an equation you get a true statement such as, 9 = 9, then the answer is infinitely many solutions. If at any point you get a false statement, such as 3 = 7, then the answer is no solution.

#4)
y = -2x + 5
2y + 2x = 0

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

$-4x + 10 + 2x = 0$

$-2x + 10 = 0$

$10 = 2x$

$5 = x$

$y = -2(5) + 5$

$y = -10 + 5$

$y = -5$

(5, -5)

#5)
$\frac{4}{7}x + \frac{-2}{3}y = 2$
2y = -2x + 20

$\cdot 7 \cdot 3$

$12x - 14y = 42$

$y = -x + 10$

$12x - 14(-x + 10) = 42$

$12x + 14x - 140 = 42$

$26x - 140 = 42$

$26x = 182$

$x = 7$

$y = -(7) + 10$

$y = 3$

(7, 3)

#6)
x + 2y = -2
.75x + .15y = 2.55

$\cdot 100 \quad \cdot 100$

$75x + 15y = 255$

$75(-2y - 2) + 15y = 255$

$-150y - 150 + 15y = 255$

$-135y + 150 = 405$

$-135y = 405$

$y = -3$

$x = -2y - 2$

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

$x = 6 - 2$

$x = 4$

(4, -3)