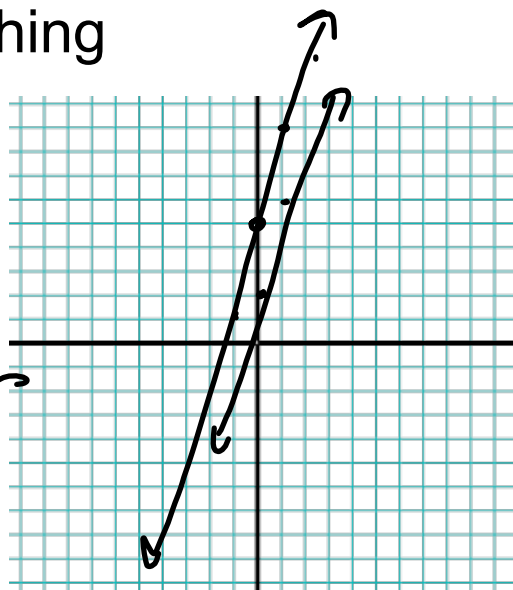


Warm Up

Solve the system by Graphing

$$\begin{aligned}
 y &= 4x + 5 \\
 -8x + 2y &= 4 \\
 +8x & \\
 \hline
 2y &= 8x + 4 \\
 y &= 4x + 2
 \end{aligned}$$

No solution



Write the equation of the line through points (2,6) and (-2,3)

$$m = \frac{3-6}{-2-4} = -\frac{3}{6}$$

Section 1.6 Solving Systems of Equations
Algebraically

Substitution Method - One equation is solved for one variable in terms of the other and then it is substituted for the variable in the other equation.

This method is useful when the coefficient of one variable is '1'

Example- Solve each system by substitution method

$$\begin{array}{l} \cancel{x + 2y = 8} \\ - 2y \\ \hline \frac{1}{2}x - y = 18 \end{array}$$

$$\begin{aligned} x &= -2y + 8 \\ \frac{1}{2}(-2y + 8) - y &= 18 \\ -1y + 4 - y &= 18 \\ -2y + 4 &= 18 \\ -2y &= \frac{14}{-2} & y = -7 \\ x &= -2(-7) + 8 \\ x &= 22 \\ & (22, -7) \end{aligned}$$

Substitution Method

~~$2x + y = 11$~~

$x + 3y = 13$

$y = -2x + 11$

$x + 3(-2x + 11) = 13$

$x - 6x + \frac{33}{3} = \frac{13}{3}$

$\frac{-5x}{-5} = \frac{-20}{-5}$

$x = 4$

$y = -2(4) + 11$

$y = -8 + 11 = 3$

 $(4, 3)$

~~$3x + y = 9$~~

$2x + 4y = 8$

$y = -3x + 9$

$2x + 4(-3x + 9) = 8$

$2x - 12x + 36 = 8$

$\frac{-10x}{-10} = \frac{-28}{-10}$

$x = \frac{14}{5}$

$y = -3\left(\frac{14}{5}\right) + 9$

$x = \frac{-42}{5} + \frac{45}{5}$

$y = \frac{-42}{5} + \frac{45}{5} = \frac{3}{5}$

Substitution Method

~~$$-3x + y = 4$$~~

$$4x + 3y = 1$$

$$y = 3x + 4$$

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

$$4x + 9x + 12 = -1$$

$$13x = -13$$

$$x = -1$$

$$y = 3\left(-\frac{1}{3}\right) + 4$$

$$y = -\frac{3}{3} + \frac{4 \cdot 3}{1 \cdot 3}$$

$$y = -\frac{3}{3} + \frac{12}{3} = \frac{9}{3}$$

$$\left(-1, \frac{9}{3}\right)$$

Substitution Method

$$4x + 2y = 10$$

$$\underline{x + 3y = 10}$$

$$x = -3y + 10$$

$$4(-3y + 10) + 2y = 10$$

$$-12y + 40 + 2y = 10$$

$$-10y = -30$$

$$y = 3$$

$$x = -3(3) + 10 = -1$$

$$(1, 3)$$

Substitution Method

$$\frac{2}{3}x + y = 3$$

$$4x + 5y = -4$$

$$y = -\frac{2}{3}x + 3$$

$$4x + 5\left(-\frac{2}{3}x + 3\right) = -4$$

$$4x - \frac{10}{3}x + 15 = -4$$

$$3 \cdot 4x - \frac{10}{3}x = (-19) \cdot 3$$

$$12x - 10x = -57$$

$$2x = -57$$

$$x = -\frac{57}{2}$$

$$x = -\frac{2}{3}\left(-\frac{57}{2}\right) + 3$$

$$x = \frac{57}{3}$$

$$x = 19 + 3 = 22 \quad \left(22, -\frac{57}{2}\right)$$

Algebra 2

Name _____ ID: 1

Assignment

Date _____ Period _____

Solve each system by substitution.

1) $x - 7y = 5$
 $-2x + 5y = -1$

2) $-3x + y = -3$
 $8x - 7y = 21$

3) $-4x + y = 0$
 $3x - 5y = -17$

4) $3x - 3y = 15$
 $x + 7y = 21$

$$\begin{aligned} 5) \quad x - y &= -13 \\ 6x + 6y &= -6 \end{aligned}$$

$$\begin{aligned} 6) \quad -5x + y &= -23 \\ 4x + 2y &= 24 \end{aligned}$$

$$\begin{aligned} 7) \quad 5x + 5y &= 10 \\ 5x + y &= 10 \end{aligned}$$

$$\begin{aligned} 8) \quad -2x - 4y &= -12 \\ -2x + y &= -2 \end{aligned}$$

$$\begin{aligned} 9) \quad 2x + 5y &= 3 \\ -6x + y &= 7 \end{aligned}$$

$$\begin{aligned} 10) \quad 8x - 3y &= -2 \\ x + 3y &= 20 \end{aligned}$$