

Worksheet 17B

Solve the following systems of equations using the substitution method.

$$1) \quad 3x - 2y = 10$$

$$y = 4$$

$$3x - 2(4) = 10$$

$$3x - 8 = 10$$

$$3x = 18$$

$$x = 6$$

$$(6, 4)$$

$$2) \quad -3x + 4y = 6$$

$$y = \frac{5}{4}x - 3$$

$$-3x + 4\left(\frac{5}{4}x - 3\right) = 6$$

$$-3x + 5x - 12 = 6$$

$$2x - 12 = 6$$

$$2x = 18$$

$$x = 9$$

$$(9, \frac{33}{4})$$

$$y = \frac{5}{4}(9) - 3$$

$$y = \frac{45}{4} - 3$$

$$y = \frac{45}{4} - \frac{12}{4}$$

$$y = \frac{33}{4}$$

$$3) \quad -2x + 3y = -6 \rightarrow y = \frac{2}{3}x - 2$$

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

$$-2x + 3\left(\frac{2}{3}x + 3\right) = -6$$

$$-2x + 2x + 9 = -6$$

$$0 + 9 = -6$$

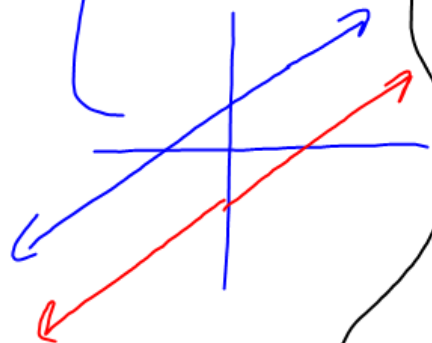
$$9 = -6$$

???



No solution

parallel



$$4) \quad 5x - 3y = 0$$

$$y = 4x - 7$$

$$5x - 3(4x - 7) = 0$$

$$5x - 12x + 21 = 0$$

$$-7x + 21 = 0$$

$$-7x = -21$$

$$x = 3$$

$$y = 4(3) - 7$$

$$y = 12 - 7$$

$$y = 5$$

(3, 5)

5) $-2x - 5y = 6$

$x = -2y + 7$

$-2(-2y + 7) - 5y = 6$

$4y - 14 - 5y = 6$

$-1y - 14 = 6$

$-1y = 20$

$y = -20$

$x = -2(-20) + 7$

$x = 40 + 7$

$x = 47$

$(47, -20)$

6) $4x - 7y = -6$

$2x = 4y - 5 \rightarrow x = 2y - \frac{5}{2}$

$4\left(2y - \frac{5}{2}\right) - 7y = -6$

$8y - 10 - 7y = -6$

$1y - 10 = -6$

$y = 4$

$\left(\frac{11}{2}, 4\right)$

$x = 2(4) - \frac{5}{2}$

$x = 8 - \frac{5}{2} = \frac{11}{2}$

$$7) \quad -3x + 6y = 10$$

$$x - 5y = 6 \rightarrow x = 6 + 5y$$

$$-3(6 + 5y) + 6y = 10$$

$$-18 + 15y + 6y = 10$$

$$-18 + 9y = 10$$

$$9y = 28$$

$$y = \frac{28}{9}$$

$$\left(\frac{-86}{9}, \frac{28}{9} \right)$$

$$x = 6 + 5\left(\frac{28}{9}\right)$$

$$x = 6 + \frac{140}{9}$$

$$x = \frac{54}{9} + \frac{140}{9}$$

$$x = \frac{194}{9}$$

$$8) \quad -3x + 7y = -2 \rightarrow 7y = 3x - 2 \rightarrow y = \frac{3x - 2}{7}$$

$$5x - 3y = 10$$

$$5x + 3\left(\frac{3x - 2}{7}\right) = 10$$

$$5x + \frac{9}{7}x + \frac{6}{7} = 10$$

$$35x + 9x + 6 = 70$$

$$26x + 6 = 70$$

$$26x = 64$$

$$x = \frac{64}{26}$$

$$x = \frac{32}{13}$$

$$y = \frac{3}{7}\left(\frac{32}{13}\right) - \frac{2}{7}$$

$$y = \frac{96}{91} - \frac{28}{91}$$

$$y = \frac{68}{91}$$

$$y = \frac{70}{91} - \frac{2}{91}$$

$$\left(\frac{32}{13}, \frac{68}{91} \right)$$