

Warm Up



Solve the following systems of equations using Substitution

$$\textcircled{1} \quad x - 3y = -22 \quad \rightarrow \textcircled{3} \quad x = (3y - 22)$$

$$\textcircled{2} \quad 3x + 2y = 11$$

$$\begin{aligned} \textcircled{2} \quad & 3x + 2y = 11 \\ & 3(3y - 22) + 2y = 11 \\ & 9y - 66 + 2y = 11 \\ & 11y - 66 = 11 \\ & \quad \quad +66 \quad \quad +66 \\ & \quad \quad \underline{11y} = \underline{77} \\ & \quad \quad \quad \quad \quad \quad \underline{11} \quad \quad \quad \underline{11} \end{aligned}$$

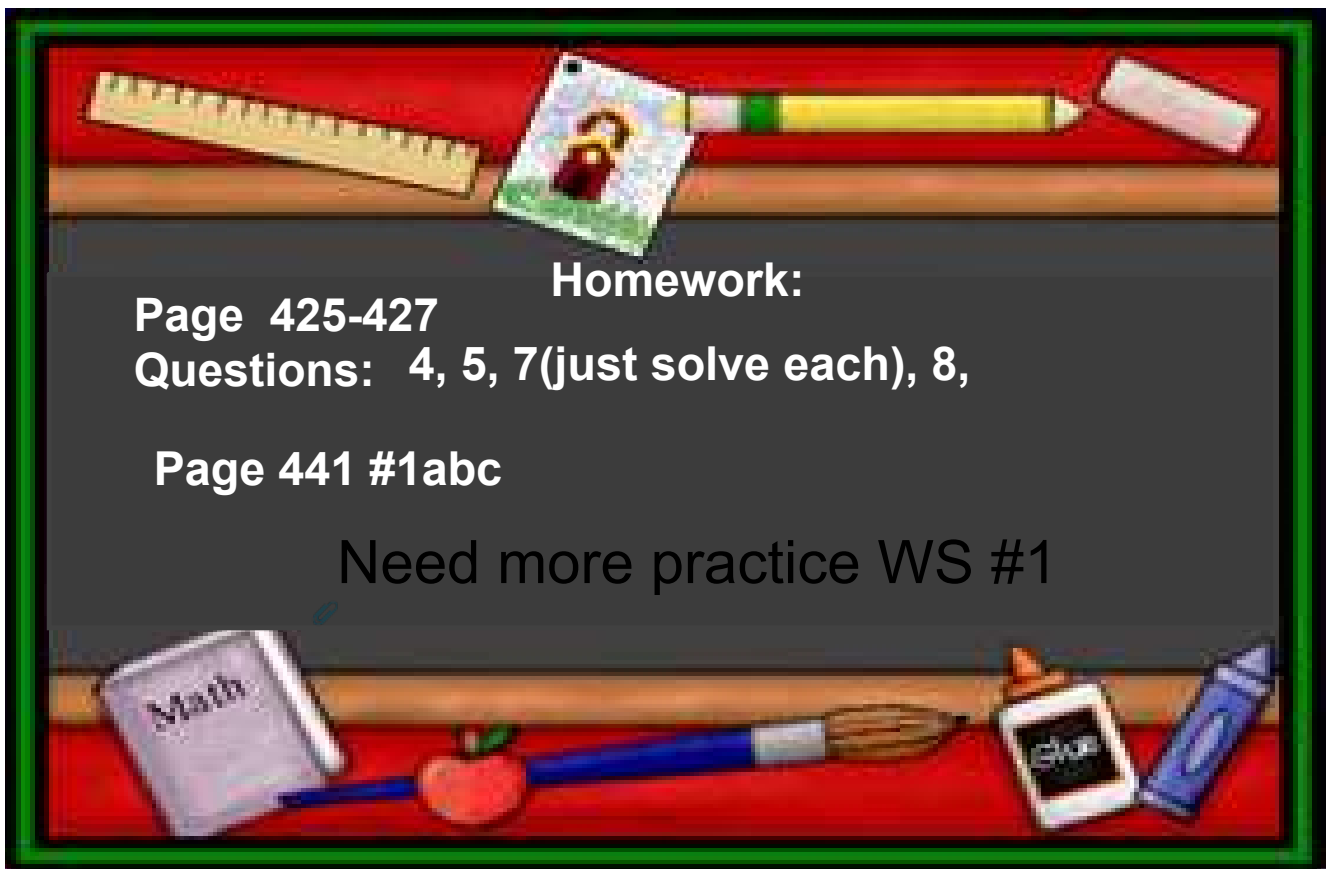
$$\boxed{y = 7}$$

$$\begin{aligned} x &= 3y - 22 \\ &= 3(7) - 22 \\ &= 21 - 22 \end{aligned}$$

$$\boxed{x = -1}$$

Point
of
intersection

$$(x, y) \\ (-1, 7)$$



Homework:
Page 425-427
Questions: 4, 5, 7(just solve each), 8,
Page 441 #1abc
Need more practice WS #1

$$\text{ii) } x - y = -1$$
$$3x + 2y = 12$$

$$(1) \quad x - y = -1$$

$$y = x + 1$$

$$m = 1$$

$$y \text{ intercept} = (0, 1)$$

$$x \text{ intercept} = (-1, 0)$$

$$(2) \quad 3x + 2y = 12$$

$$2y = -3x + 12$$

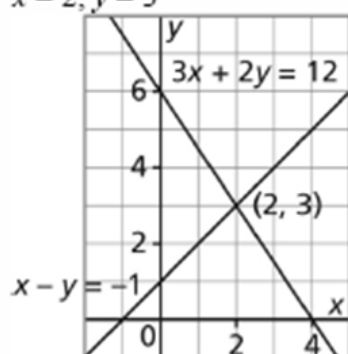
$$y = \frac{-3x + 6}{2}$$

$$m = -3/2$$

$$y \text{ intercept} = (0, 6)$$

$$x \text{ intercept} = (4, 0)$$

$$\text{ii) } x = 2, y = 3$$



iii) $5x + 4y = 10$
 $5x + 6y = 0$

(1) $5x + 4y = 10$

$$4y = -5x + 10$$

$$y = \frac{-5x + 10}{4} = \frac{-5x}{4} + \frac{10}{4} = \frac{-5x}{4} + \frac{5}{2}$$

$$m = -5/4$$

$$y \text{ intercept} = (0, 2.5)$$

$$x \text{ intercept} = (2, 0)$$

(2) $5x + 6y = 0$

$$6y = -5x$$

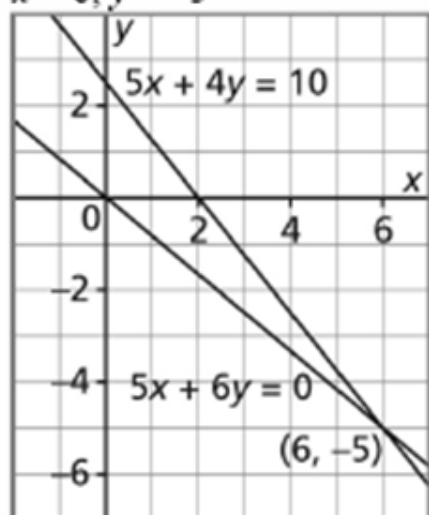
$$y = \frac{-5x}{6}$$

$$m = -5/6$$

$$y \text{ intercept} = (0, 0)$$

$$x \text{ intercept} = (0, 0)$$

iii) $x = 6, y = -5$



$$\text{iv) } \begin{aligned} x + 2y &= -1 \\ 2x + y &= -5 \end{aligned}$$

$$(1) \quad x + 2y = -1$$

$$2y = -x - 1$$

$$y = -\frac{1}{2}x - \frac{1}{2}$$

$$m = -1/2$$

$$y \text{ intercept} = (0, -1/2)$$

$$x \text{ intercept} = (-1, 0)$$

$$(2) \quad 2x + y = -5$$

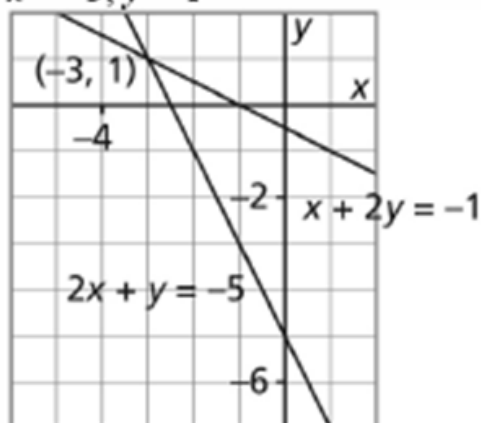
$$y = -2x - 5$$

$$m = -2$$

$$y \text{ intercept} = (0, -5)$$

$$x \text{ intercept} = (-2.5, 0)$$

$$\text{iv) } x = -3, y = 1$$



- b) Choose one linear system from part a. Explain the meaning of the point of intersection of the graphs of a system of linear equations.

The coordinates of the point of intersection represent the solution of the linear system.

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Questions: 4, 5, 8, 9

4a) ① $y = 9 - x$

② $2x + 3y = 11$

 $2x + 3y = 11$

$2x + 3(9 - x) = 11$

$2x + 27 - 3x = 11$

$-x + 27 = 11$

$-x = 11 - 27$

$-x = -16$

$x = 16$

$y = 9 - x$

$y = 9 - 16$

$y = -7$

b) $x = y - 1$

$3x - y = 11$

 $3(y - 1) - y = 11$

$3y - 3 - y = 11$

$2y - 3 = 11$

$2y = 11 + 3$

$2y = 14$

$y = 7$

$x = y - 1$

$x = 7 - 1$

$x = 6$

$$\begin{aligned} \text{c) } x &= 7 + y \\ 2x + y &= -10 \end{aligned}$$

$$2(7+y) + y = -10$$

$$14 + 2y + y = -10$$

$$14 + 3y = -10$$

$$3y = -10 - 14$$

$$3y = -24$$

$$\boxed{y = -8}$$

$$x = 7 + y$$

$$x = 7 + (-8)$$

$$\boxed{x = -1}$$

$$\begin{aligned} \text{d) } 3x + y &= 7 \\ y &= x + 3 \end{aligned}$$

$$3x + (x+3) = 7$$

$$4x + 3 = 7$$

$$4x = 7 - 3$$

$$4x = 4$$

$$\boxed{x = 1}$$

$$y = x + 3$$

$$y = 1 + 3$$

$$\boxed{y = 4}$$

$$5) \textcircled{1} 2x + 3y = 11$$

$$\textcircled{2} 4x - y = -13$$

$$\textcircled{2} 4x - y = -13$$

$$-y = -4x - 13$$

$$y = 4x + 13$$

Substitute into equation 1

$$2x + 3y = 11$$

$$2x + 3(4x + 13) = 11$$

$$2x + 12x + 39 = 11$$

$$14x + 39 = 11$$

$$14x = 11 - 39$$

$$14x = -28$$

$$x = -2$$

Substitute back into to see what $y =$

$$y = 4x + 13$$

$$y = 4(-2) + 13$$

$$y = -8 + 13$$

$$y = 5$$

$$x = -2, y = 5$$

$$b) \textcircled{1} 4x + y = -5$$

$$\textcircled{2} 2x + 3y = 5$$

$$\textcircled{1} 4x + y = -5$$

$$y = -4x - 5$$

Sub into equation 2

$$2x + 3y = 5$$

$$2x + 3(-4x - 5) = 5$$

$$2x - 12x + 15 = 5$$

$$-10x + 15 = 5$$

$$-10x = 5 - 15$$

$$-10x = -10$$

$$x = 1$$

Sub into equation
to solve for y

$$y = -4x - 5$$

$$y = -4(1) - 5$$

$$y = -4 - 5$$

$$y = -9$$

$$x = 1 \quad y = -9$$

$$c) \textcircled{1} x + 2y = 13$$

$$\textcircled{2} 2x - 3y = -9$$

$$\textcircled{1} x + 2y = 13$$

$$x = -2y + 13$$

Sub into equation 2

$$2x - 3y = -9$$

$$2(-2y + 13) - 3y = -9$$

$$-4y + 26 - 3y = -9$$

$$-7y + 26 = -9$$

$$-7y = -9 - 26$$

$$-7y = -35$$

$$y = 5$$

Sub into equation to solve for x

$$x = -2y + 13$$

$$x = -2(5) + 13$$

$$x = -10 + 13$$

$$x = -3$$

$$x = -3, y = 5$$

$$d) \textcircled{1} 3x + y = 7$$

$$\textcircled{2} 5x + 2y = 13$$

$$\textcircled{1} 3x + y = 7$$

$$y = -3x + 7$$

Sub into equation 2

$$5x + 2y = 13$$

$$5x + 2(-3x + 7) = 13$$

$$5x - 6x + 14 = 13$$

$$-x + 14 = 13$$

$$-x = 13 - 14$$

$$-x = -1$$

$$x = 1$$

Sub into equation to solve for y

$$y = -3x + 7$$

$$y = -3(1) + 7$$

$$y = -3 + 7$$

$$y = 4$$

$$x = 1, y = -4$$

$$8a) \frac{x}{3} - \frac{y}{2} = 2$$

$$\frac{5x}{6} + \frac{3y}{4} = 1$$

$$6 \left[\frac{x}{3} - \frac{y}{2} = 2 \right]$$

$$12 \left[\frac{5x}{6} + \frac{3y}{4} = 1 \right]$$

$$\frac{6x}{3} - \frac{6y}{2} = 12$$

$$\frac{60x}{6} + \frac{36y}{4} = 12$$

$$2x - 3y = 12$$

$$10x + 9y = 12$$

New equations to work with

$$\textcircled{1} 2x - 3y = 12$$

$$\textcircled{2} 10x + 9y = 12$$

$$\textcircled{1} 2x - 3y = 12$$

$$2x = 3y + 12$$

$$x = \frac{3}{2}y + 6$$

Sub into equation 2

$$10x + 9y = 12$$

$$10 \left(\frac{3}{2}y + 6 \right) + 9y = 12$$

$$\frac{30}{2}y + 60 + 9y = 12$$

$$15y + 60 + 9y = 12$$

$$24y = 12 - 60$$

$$24y = -48$$

$$y = -2$$

Now sub $y = -2$ into

$$x = \frac{3}{2}y + 6$$

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

$$x = \frac{-6}{2} + 6$$

$$x = -3 + 6$$

$$x = 3$$

$$9) \quad 2x + 2y = -4$$

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

$$-12x + 4y = -24$$

$$4(-3x + y = -6)$$

$$\textcircled{1} \quad x + y = -2$$

$$\textcircled{2} \quad -3x + y = -6$$

$$\textcircled{1} \quad x + y = -2$$

$$x = -y - 2$$

sub into $\textcircled{2}$

$$-3x + y = -6$$

$$-3(-y - 2) + y = -6$$

$$3y + 6 + y = -6$$

$$4y + 6 = -6$$

$$4y = -12$$

$$y = -3$$

Sub $y = -3$ into

$$x = -y - 2$$

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

$$x = 3 - 2$$

$$x = 1$$

$$10) \textcircled{1} r + n = 186$$

$$\textcircled{2} n - r = 94$$

$$\textcircled{1} r + n = 186$$

$$r = 186 - n$$

$$\textcircled{2} n - r = 94$$

$$n - (186 - n) = 94$$

$$n - 186 + n = 94$$

$$2n - 186 = 94$$

$$2n = 94 + 186$$

$$2n = 280$$

$$n = 140$$

$$\textcircled{3} r = 186 - n$$

$$r = 186 - (140)$$

$$r = 46$$

$$11) \textcircled{1} 2l + 2w = 540$$

$$\textcircled{2} l - w = 90$$

$$\textcircled{2} l - w = 90$$

$$l = 90 + w$$

$$\textcircled{1} 2l + 2w = 540$$

$$2(90 + w) + 2w = 540$$

$$180 + 2w + 2w = 540$$

$$180 + 4w = 540$$

$$4w = 540 - 180$$

$$4w = 360$$

$$w = 90$$

$$l = 90 + w$$

$$l = 90 + 90$$

$$l = 180$$

$$14) \textcircled{1} p + a = 85$$

$$\textcircled{2} 0.6p + 0.4a = 38$$

$$\textcircled{1} p + a = 85$$

$$p = -a + 85$$

$$\textcircled{2} 0.6p + 0.4a = 38$$

$$0.6(-a + 85) + 0.4a = 38$$

$$-0.6a + 51 + 0.4a = 38$$

$$-0.2a + 51 = 38$$

$$-0.2a = 38 - 51$$

$$-0.2a = -13$$

$$a = \frac{-13}{-0.2}$$

$$a = 65$$

$$\textcircled{3} \text{ solve for } p$$

$$p = -a + 85$$

$$p = -65 + 85$$

$$p = 20$$

$$19) \textcircled{1} \frac{1}{2}x + \frac{2}{3}y = 1$$

$$6\left(\frac{1}{2}x + \frac{2}{3}y = 1\right)$$

$$\frac{6}{2}x + \frac{12}{3}y = 6$$

$$\textcircled{1} \boxed{3x + 4y = 6}$$

$$3x = -4y + 6$$

$$\boxed{x = \frac{-4y}{3} + 2}$$

Now sub into new equation #2

$$3x - 4y = 30$$

$$3\left(\frac{-4}{3}y + 2\right) - 4y = 30$$

$$-12\frac{y}{3} + 6 - 4y = 30$$

$$-4y + 6 - 4y = 30$$

$$-8y + 6 = 30$$

$$-8y = 30 - 6$$

$$-8y = 24$$

$$\boxed{y = -3}$$

$$\textcircled{2} \frac{1}{4}x - \frac{1}{3}y = \frac{5}{2}$$

$$12\left(\frac{1}{4}x - \frac{1}{3}y = \frac{5}{2}\right)$$

$$\frac{12x}{4} - \frac{12}{3}y = \frac{60}{2}$$

$$\textcircled{2} \boxed{3x - 4y = 30}$$

These are now the new equations.

Now sub $y = -3$ into

$$x = \frac{-4}{3}y + 2$$

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

$$x = \frac{12}{3} + 2$$

$$x = 4 + 2$$

$$\boxed{x = 6}$$

Attachments

Assignment #1 Sub.pdf