

# System Word Problem Day 1

## Word Problem Quiz on 12/12 (Next Wednesday)

Ex1) Danielle bought some supplies for her party. 3 rolls of streamers & 15 party hats cost her \$30. Later, she went back to Party City and bought 2 rolls of streamers & 4 party hats for \$11.

How much did each roll of streamers cost? How much did each party hat cost?

$x$  = cost of streamers

$y$  = cost of hats

$$\begin{cases} (3x + 15y = 30) - 2 \rightarrow -6x - 30y = -60 \\ (2x + 4y = 11) 3 \rightarrow 6x + 12y = 33 \end{cases}$$

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$$-18y = -27$$

$$y = 1.5$$

$$2x + 4(1.5) = 11$$

$$2x + 6 = 11$$

$$2x = 5$$

$$x = 2.5$$

Answer must in word:  
Each roll of streamers costs \$2.50, each hat costs \$1.50.

Ex2) Alec is buying the meat for his Superbowl cookout. He needs to buy 8 package of meat. A package of hotdogs cost \$1.60 & a package of hamburgers cost \$5. He spent a total of \$23. **How many packages of each type of meat did he buy?**

$x = \#$  of hotdogs

$y = \#$  hamburgers

$$\begin{cases} x + y = 8 & \longrightarrow y = \boxed{-x + 8} = -5 + 8 = 3 \\ 1.6x + 5\boxed{y} = 23 \end{cases}$$

$$1.6x + 5(-x + 8) = 23$$

$$1.6x - 5x + 40 = 23$$

$$-3.4x + 40 = 23$$

$$\begin{array}{r} -40 \quad -40 \\ \hline \end{array}$$

$$-3.4x = -17$$

$$x = 5$$

Alec bought 5 packages of hotdogs and 3 packages of Hamburgers.

Ex3) Brianna spent \$14 to rent 5 movies for the weekend. New releases rent for \$3 and regular movies rent for \$2.50. How many of each did Brianna rent?

$x = \#$  of New Releases  
 $y = \#$  of Regular

$$\begin{cases} x + y = 5 \rightarrow y = \boxed{-x + 5} = -3 + 5 = 2 \\ 3x + 2.5y = 14 \end{cases}$$

$$3x + 2.5(-x + 5) = 14$$

$$3x - 2.5x + 12.5 = 14$$

$$0.5x + 12.5 = 14$$

$$\begin{array}{r} -12.5 \quad -12.5 \\ \hline 0.5x = 1.5 \end{array}$$

$$0.5x = 1.5$$

$$x = 3$$

Brianna rented 3  
New Release and  
2 Regular movies.

Ex4) The Chinese club & Spanish club had a fundraiser to buy supplies for a fundraiser. The Chinese club spent \$135 buying 6 cases of juice and 1 case of bottled water. The Spanish club spent \$110 buying 4 cases of juice and 2 cases of bottled water. **How much did a case of juice cost? How much did a case of bottled water cost?**

$x = \text{cost of juice}$   
 $y = \text{cost of water}$

$$\begin{cases} 6x + y = 135 \rightarrow y = -6x + 135 \\ 4x + 2y = 110 \end{cases}$$

$$4x + 2(-6x + 135) = 110$$

$$4x - 12x + 270 = 110$$

$$-8x + 270 = 110$$

$$\begin{array}{r} -270 \quad -270 \\ \hline -8x = -160 \end{array}$$

$$-8x = -160$$

$$x = 20$$

$$= -6(20) + 135$$

$$= -120 + 135$$

$$= 15$$

Each case of juice costs \$20, each case of bottle water costs \$15.

**Try this)** Two records and three tapes cost \$31. Three records and two tapes cost \$29. Find the cost of each record and each tape.

$$\begin{array}{l} x = \# \text{ of Records} \\ y = \# \text{ of Tapes} \end{array} \quad \begin{array}{l} -3(2x + 3y = 31) \rightarrow \\ 2(3x + 2y = 29) \rightarrow \end{array} \quad \begin{array}{l} \cancel{-6x} - 9y = -93 \\ \cancel{6x} + 4y = 58 \end{array}$$

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$$2x + 3(7) = 31$$

$$-5y = -35$$

$$2x + 21 = 31$$

$$y = 7$$

$$2x = 10$$

$$x = 5$$

Each record costs \$5, each tape costs \$7.

Ex5) Three times the larger of two numbers is equal to four times the smaller. The sum of the numbers is 21. Find the numbers.

$x = \text{larger \#}$   
 $y = \text{smaller \#}$

$$\begin{cases} 3x = 4y \\ x + y = 21 \end{cases} \rightarrow y = -x + 21 = -12 + 21 = 9$$

$$3x = 4(-x + 21)$$

$$3x = -4x + 84$$

$$\begin{array}{r} +4x \quad +4x \\ \hline \end{array}$$

$$7x = 84$$

$$x = 12$$

The larger # is 12, smaller # is 9.

Ex6) The sum of two numbers is the same as four times the smaller number. If twice the larger is decreased by the smaller, the result is 30. Find the numbers.

$x = \text{larger \#}$   
 $y = \text{smaller \#}$

$$\begin{cases} x + y = 4y \rightarrow x = 3y = 3(6) = 18 \\ 2x - y = 30 \end{cases}$$

"less than"

switch the order.

ex) 2 less than 3 times  
a number:  $3x - 2$

$$2(3y) - y = 30$$

$$6y - y = 30$$

$$5y = 30$$

$$y = 6$$

The larger # is  
18, smaller #  
is 6.

**Try this)** The difference between two numbers is 16. Five times the smaller is the same as 8 less than twice the larger. Find the numbers.

$x = \text{larger \#}$

$y = \text{smaller \#}$

$$\begin{cases} x - y = 16 & \rightarrow x = y + 16 = 8 + 16 \\ 5y = 2x - 8 & = 24 \end{cases}$$

$$5y = 2(y + 16) - 8$$

$$5y = 2y + 32 - 8$$

$$\begin{array}{r} -2y \quad -2y \\ \hline \end{array}$$

$$3y = 24$$

$$y = 8$$

The larger # is 24, smaller is 8.