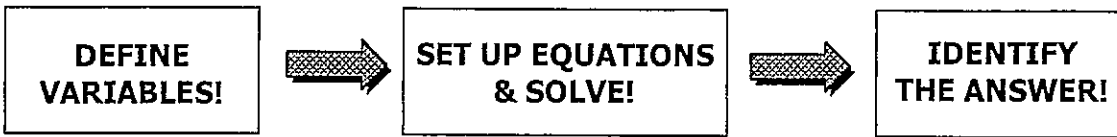


Systems Word Problems



<p>1. The sum of two numbers is 30 and their difference is 12. Find the two numbers.</p> $\begin{array}{r} x+y=30 \\ x-y=12 \\ \hline 2x=42 \\ x=21 \end{array} \quad y=9$	<p>2. The sum of two numbers is 24 and their difference is 2. What are the numbers?</p> $\begin{array}{r} x+y=24 \\ x-y=2 \\ \hline 2x=26 \\ x=13 \end{array} \quad y=11$
<p>3. The difference between two numbers is 9. The first number plus twice the other number is 27. Find the two numbers.</p> $\begin{array}{r} x-y=9 \\ -x+2y=27 \\ \hline -y=-18 \\ y=6 \end{array} \quad x=15$	<p>4. The sum of two numbers is 36. Twice the first number minus the second is 6. Find the numbers.</p> $\begin{array}{r} x+y=36 \\ 2x-y=6 \\ \hline 3x=42 \\ x=14 \end{array} \quad y=22$
<p>5. The sum of two numbers is 20. The difference between three times the first number and twice the second is 40. Find the two numbers.</p> $\begin{array}{r} (x+y=20) \times 2 \\ 3x-2y=40 \\ 2x+2y=40 \\ \hline 5x=80 \\ x=16 \end{array} \quad y=4$	<p>6. The sum of two numbers is 25. One number is twice the second number plus seven. What are the two numbers?</p> $\begin{array}{r} x+y=25 \\ x=2y+7 \\ \hline x+y=25 \\ -x+2y=7 \\ \hline 3y=18 \\ y=6 \end{array} \quad x=19$
<p>7. The cost of 3 boxes of envelopes and 4 boxes of notebook paper is \$13.25. Two boxes of envelopes and 6 boxes of notebook paper cost \$17. Find the cost of each.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> $\begin{array}{r} (3x+4y=13.25) \times 2 \\ (2x+6y=17) \times -3 \\ \hline 6x+8y=26.50 \\ -6x-18y=-51 \\ \hline -10y=-24.50 \\ y=2.45 \end{array}$ </div> <div style="width: 45%;"> $\begin{array}{r} 2x+6(2.45)=17 \\ 2x+14.70=17 \\ \hline 2x=2.30 \\ x=1.15 \end{array}$ </div> </div>	

4.00
51.80
26.50
24.50

23
2.95
14.70
18.00
14.70
2.30

8. The cost of 12 oranges and 7 apples is \$5.36. Eight oranges and 5 apples cost \$3.68. Find the cost of each. Let $x = \text{oranges}$
 $y = \text{apples}$

$$\begin{aligned} 8x + 5(0.32) &= 3.68 \\ 8x + 1.60 &= 3.68 \\ \underline{-1.60 \quad -1.60} & \\ 8x &= 2.08 \\ x &= \$0.26 \text{ for an orange} \end{aligned}$$

$$\begin{aligned} (12x + 7y &= 5.36) \cdot 2 \\ (8x + 5y &= 3.68) \cdot -3 \\ \hline 24x + 14y &= 10.72 \\ -24x - 15y &= -11.04 \\ \hline -1y &= 0.32 \\ y &= \$0.32 \text{ for an apple} \end{aligned}$$

9. Gabby and Sydney bought some pens and pencils. Gabby bought 4 pens and 5 pencils for \$6.71. Sydney bought 5 pens and 3 pencils for \$7.12. Find the cost of each. Let $x = \text{pens}$
 $y = \text{pencils}$

$$\begin{aligned} (4x + 5y &= 6.71) \cdot 5 \\ (5x + 3y &= 7.12) \cdot -4 \\ \hline 20x + 25y &= 33.55 \\ -20x - 12y &= -28.48 \\ \hline 13y &= 5.07 \\ y &= \$0.39 \text{ for a pencil} \end{aligned}$$

$$\begin{aligned} 4x + 5(0.39) &= 6.71 \\ 4x + 1.95 &= 6.71 \\ \underline{-1.95 \quad -1.95} & \\ 4x &= 4.76 \\ x &= \$1.19 \text{ for a pen} \end{aligned}$$

10. At a sale on winter clothing, Cody bought two pairs of gloves and four hats for \$43.00. Tori bought two pairs of gloves and two hats for \$30.00. Find the cost of each. Let $g = \text{cost of gloves}$
 $h = \text{cost of hats}$

$$\begin{aligned} 2g + 4h &= 43.00 \\ -2g + 2h &= -30.00 \\ \hline 2h &= 13 \\ h &= \$6.50 \text{ for hats} \end{aligned}$$

$$\begin{aligned} 2g + 4(6.50) &= 43 \\ 2g + 26 &= 43 \\ 2g &= 17 \\ g &= \$8.50 \text{ for gloves} \end{aligned}$$

11. A garden supply store sells two types of lawn mowers. The smaller mower costs \$249.99 and the larger mower cost \$329.99. If 30 total mowers were sold and the total sales for a given year was \$8379.70, find how many of each type were sold.

$$\begin{aligned} \text{Let } x &= \text{small mowers } 249.99x + 329.99y = 8379.70 \\ y &= \text{large mowers} \\ (x + y &= 30) \cdot -249.99 \\ \hline -249.99x - 249.99y &= -7499.70 \\ \hline 80y &= 880 \\ y &= 11 \text{ large mowers} \\ x &= 19 \text{ small mowers} \end{aligned}$$

12. The Town Recreation Department ordered a total of 100 baseballs and bats for the summer baseball camp. Baseballs cost \$4.50 each and bats cost \$20 each. The total purchase was \$822. How many of each item was ordered? Let $x = \text{\# of baseballs}$
 $y = \text{\# of bats}$

$$\begin{aligned} (x + y &= 100) \cdot -4.50 \\ 4.50x + 20y &= 822 \\ \underline{-4.50x - 4.50y &= -450} \\ 15.50y &= 372 \\ y &= 24 \text{ bats} \\ x &= 76 \text{ baseballs} \end{aligned}$$

13. A group of 40 children attended a baseball game on a field trip. Each child received either a hot dog or bag of popcorn. Hot dogs were \$2.25 and popcorn was \$1.75. If the total bill was \$83.50, how many hotdogs and bags of popcorn were purchased? Let $h = \#$ of hot dogs
 $b = \#$ of bags of popcorn

$$\begin{aligned} (h + b = 40) \cdot 2.25 \\ 2.25h + 1.75b = 83.50 \\ -2.25h - 2.25b = -90 \\ \hline -0.50b = -6.50 \\ -0.50 \end{aligned}$$

$$b = 13 \text{ bags of popcorn} \quad h = 27 \text{ hot dogs}$$

14. One night a theater sold 548 movie tickets. An adult's ticket costs \$6.50 and a child's ticket cost \$3.50. In all, \$2881 was taken in. How many of each kind of ticket were sold?

Let $a =$ adult tickets
 $c =$ children tickets

$$\begin{aligned} (a + c = 548) \cdot 3.50 \\ 6.50a + 3.50c = 2881 \\ -3.50a - 3.50c = -1918 \\ \hline 3a = 963 \end{aligned}$$

$$a = 321 \text{ adult tickets} \quad c = 227 \text{ children tickets}$$

15. Adult tickets for the school musical sold for \$3.50 and student tickets sold for \$2.50. On a given night, 321 tickets were sold for \$937.50. How many of each kind of ticket were sold?

Let $a =$ adult tickets
 $c =$ student tickets

$$\begin{aligned} (a + c = 321) \cdot 2.50 \\ 3.50a + 2.50c = 937.50 \\ -2.50a - 2.50c = -802.50 \\ \hline a = 135 \text{ adult tickets} \\ c = 185 \text{ student tickets} \end{aligned}$$

16. A collection of dimes and nickels is worth \$3.30. If there are 42 coins in all, how many of each kind of coin are there? Let $d = \#$ of dimes
 $n = \#$ of nickels

$$\begin{aligned} 0.10d + 0.05n = 3.30 \\ (d + n = 42) \cdot 0.10 \\ -0.10d - 0.10n = -4.20 \\ \hline -0.05n = -0.90 \end{aligned}$$

$$n = 18 \text{ nickels} \quad d = 24 \text{ dimes}$$

17. Mary has a collection of nickels and quarters for a total value of \$4.90. If she has 42 coins total, how many of each kind are there? Let $n = \#$ of nickels
 $q = \#$ of quarters

$$\begin{aligned} 0.05n + 0.25q = 4.90 \\ (n + q = 42) \cdot 0.05 \\ -0.05n - 0.05q = -2.10 \\ \hline 0.20q = 2.80 \end{aligned}$$

$$q = 14 \text{ quarters} \quad n = 28 \text{ nickels}$$

18. Rob has \$1.65 in nickels and dimes. He has 25 coins in all. How many of each kind of coin are there?

Let $n = \#$ of nickels
 $d = \#$ of dimes

$$\begin{array}{r} 0.05n + 0.10d = 1.65 \\ (n + d = 25) \cdot 0.05 \\ \hline -0.05n - 0.05d = -1.25 \\ \hline 0.05d = 0.40 \\ d = 8 \text{ dimes} \\ n = 17 \text{ nickels} \end{array}$$

19. Mrs. Wilson tells you that the next test is worth 100 points and contains 38 problems. Multiple-choice questions are worth 2 points each and word problems are worth 5 points. How many of each type of question are there?

Let $m = \#$ of multiple choice
 $w = \#$ of word problems

$$\begin{array}{r} (m + w = 38) \cdot 2 \\ 2m + 5w = 100 \\ -2m - 2w = -76 \\ \hline 3w = 24 \end{array}$$

$w = 8$ word problems $m = 30$ multiple choice

20. Ms. Snow decides to give a test worth 90 points and contains 25 questions. Multiple-choice questions are worth 3 points and word problems are worth 4 points. How many of each type of question are there?

Let $m = \#$ of multiple choice
 $w = \#$ of word problems

$$\begin{array}{r} (m + w = 25) \cdot 3 \\ 3m + 4w = 90 \\ -3m - 3w = -75 \\ \hline w = 15 \text{ word problems} \end{array}$$

$m = 10$ multiple choice

GOOD WORK!

