

## Linear Systems Word Problems

1. A test has twenty questions worth 100 points. The test consists of True/False questions worth 3 points each and multiple choice questions worth 11 points each. How many multiple choice questions are on the test?

Equation 1:  $t + m = 20$

Equation 2:  $3t + 11m = 100$

$m = 5$   
 $t = 15$

Solution: 5

2. The difference of two numbers is 3. Their sum is 13. What are the two numbers?

Equation 1:  $x - y = 3$

Equation 2:  $x + y = 13$

Solution:  $x = 8$   $y = 5$

3. The admission fee at a small fair is \$1.50 for children and \$4.00 for adults. On a certain day, 2200 people enter the fair and \$5050 is collected. How many children and how many adults attended?

Equation 1:  $1.5c + 4a = 5050$

Equation 2:  $c + a = 2200$

Solution:  $c = 1500$   $a = 700$

4. At an ice cream parlor, ice cream cones cost \$1.10 and sundaes cost \$2.35. One day, the receipts for a total of 172 cones and sundaes were \$294.20. How many cones were sold?

Equation 1:  $1.10c + 2.35s = 294.20$

Equation 2:  $c + s = 172$

$c = 84$   
 $s = 88$

Solution: 84 cones

5. Lisa goes to the mall one day and buys four shirts and three pairs of pants for \$85.50. She returns the next day and buys three shirts and five pairs of pants for \$115.00. What is the price of each shirt and each pair of pants?

Equation 1:  $4s + 3p = 85.50$

Equation 2:  $3s + 5p = 115.00$

$s = 7.50$   
 $p = 18.50$

Solution: shirt 7.50  
pant 18.50

# SYSTEMS OF LINEAR EQUATIONS WORD PROBLEMS WORKSHEET

1. A multiple choice test consists of 100 questions. A correct answer is worth 2 marks, while an incorrect answer is worth -1 marks. If a student receives a score of 80, how many questions did this student answer incorrectly?

$$\begin{aligned}2c - i &= 80 \\ c + i &= 100\end{aligned}$$

$$\begin{aligned}c &= 60 \\ i &= 40\end{aligned}$$

2. White chocolate costs \$2.00 per bar, and dark chocolate costs \$2.50 per bar. If you buy 15 bars of chocolate for \$34 dollars, how many bars of dark chocolate did you buy?

$$\begin{aligned}2w + 2.5d &= 34 \\ w + d &= 15\end{aligned}$$

$$\begin{aligned}d &= 8 \\ w &= 7\end{aligned}$$

3. A cellular company's revenue and cost functions for selling mobile phones can be modelled by the linear equations  $R = 50n$  and  $C = 10n + 300$ , where  $R$  represents the revenue in dollars,  $C$  represents the cost, and  $n$  represents the number of phones sold. At what point will this company have no profit?

(Profit = Revenue - Cost)

$$0 = 50n - (10n + 300)$$

4. The sum of two numbers is 17. The difference between the larger number and the smaller number is 7. What is the value of the smaller number?

$$\begin{aligned}n + m &= 17 \\ m - n &= 7\end{aligned}$$

5. John has \$5.05 in quarters and nickels in his pocket. If John only has 25 coins in his pocket, how many of the coins are quarters?

$$\begin{aligned}0.25q + 0.05n &= 5.05 \\ q + n &= 25\end{aligned}$$

6. A class of 32 consists of students who either have red or yellow shirts. If there are 12 more people with red shirts than there are people with yellow shirts, how many of the students have red shirts?

$$r + y = 32$$

$$y + 12 = r$$

$$r = ?$$