

## LINEAR EQUATIONS

### WORKSHEET - B

- Q1. After 12 years, I shall be 3 times as old as I was 4 years ago. Find my present age.
- Q2. A man sold an article for 7396 and gained 10% on it. Find the cost price of the article.
- Q3. The sum of the two numbers is 4500. If 10% of one number is 12.5% of the other, find the numbers.
- Q4. The sum of two numbers is 405 and their ratio is 8: 7. Find the numbers.
- Q5. The ages of A and B are in the ratio 7: 5. Ten years hence, the ratio of their ages will be 9: 7. Find their present ages.
- Q6. Find the number whose double is 45 greater than its half.
- Q7. The difference between the squares of two consecutive numbers is 31. Find the numbers.
- Q8. Find a number such that when 5 is subtracted from 5 times the number, the result is 4 more than twice the number.
- Q9. The numerator of a fraction is 5 less than its denominator. If 3 is added to the numerator, and denominator both, the fraction becomes  $\frac{4}{5}$ . Find the original fraction.
- Q10. The present age of a man is twice that of his son. Eight years hence, their ages will be in the ratio 7: 4. Find their present ages.

## ANSWERS

1. Let present age =  $x$  years.  
 According to question,  
 $(x + 12) = 3(x - 4)$   
 $x + 12 = 3x - 12$   
 $2x = 24$   
 $\Rightarrow x = 12 \text{ years}$   
 Present age = 12 years.
  
2. SP of article = ₹ 396  
 Gain = 10%  
 Let cost price = ₹  $x$   
 $\therefore SP = \frac{x \times (100 + 10)}{100} = \frac{110}{100} x$   
 $\therefore x = \frac{396 \times 100}{110} = 360$   
 Cost price of an article = ₹ 360
  
3. Let the first number =  $x$   
 and the second number =  $y$   
 According to the question,  
 $x + y = 4500 \dots \dots (i)$   
 and  $10\% x = 12.5\% y$   
 i.e.,  $10x = 12.5y$   
 $x = \frac{12.5}{10} y + y = 45,000$   
 $12.5y + 10y = 45,000$   
 $22.5y = 45,000$   
 $y = \frac{45,000}{22.5} = 2000$   
 Now, put the value of  $y$  in equation (i)  
 $x = \frac{12.5}{10} \times 2000$   
 $x = 2500$   
 Hence, the numbers are 2500 and 2000.
  
4. Let the first number =  $x$   
 and the second number =  $y$   
 According to the question,  $x + y = 405 \dots (i)$   
 and the numbers are in the ratio of 8 : 7  
 i.e.,  $\frac{8x}{7y} = 1$   
 $\Rightarrow 8x = 7y$   
 $\Rightarrow x = \frac{7}{8} y$   
 Now, substitute the value  $x$  in equation (i)  
 $\frac{7}{8} y + y = 405$

$$7y + 8y = 405 \times 8$$

$$15y = 3240$$

$$y = \frac{3240}{15}$$

$$y = 216$$

Now, put the value of  $y$  in equation (ii)

$$x = \frac{7}{8} \times 216$$

$$x = 7 \times 27$$

$$x = 189$$

Hence, the numbers are 189 and 216.

5. Ratio in the present ages of A and B = 7 : 5

Let age of A =  $7x$  years

Let age of B =  $5x$  years

10 years hence,

Then age of A =  $7A + 10$  years

and age of B =  $5x + 10$  years

According to the condition,

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

By crossing multiplication

$$7(7x + 10) = 9(5x + 10)$$

$$\Rightarrow 49x + 70 = 45x + 90$$

$$\Rightarrow 49x - 45x = 90 - 70$$

$$\Rightarrow 4x = 20$$

$$\Rightarrow x = \frac{20}{4}$$

$$\Rightarrow x = 5$$

Present age of A =  $7x = 7 \times 5 = 35$  years.

and present age of B =  $5x = 5 \times 5 = 25$  years.

6. Let the required number =  $x$ .

Double of it is  $2x$

According to the condition,

$$2x - \frac{x}{2} = 45$$

$$\Rightarrow \frac{4x-x}{2} = 45 \Rightarrow \frac{3}{2}x = 45$$

$$\Rightarrow x = \frac{45 \times 2}{3} = 30$$

Required number = 30

7. Let the first number =  $x$ .

and the second number =  $x + 1$ .

$$\therefore (x + 1)^2 - (x)^2 = 31$$

$$\Rightarrow x^2 + 2x + 1 - x^2 = 31$$

$$\Rightarrow 2x = 31 - 1 = 30$$

$$\Rightarrow x = \frac{30}{2} = 15$$

First number = 15  
 and second number =  $15 + 1 = 16$   
 Hence, the numbers are 15 and 16

8. Let the required number =  $x$ .  
 5 times of it =  $5x$ .  
 Twice of it =  $2x$ .

According to the condition,

$$5x - 5 = 2x + 4$$

$$\Rightarrow 5x - 2x = 4 + 5$$

$$\Rightarrow 3x = 9$$

$$\Rightarrow x = \frac{9}{3}$$

$$\Rightarrow x = 3$$

Required number = 3

9. Let denominator of the original fraction =  $x$ .

Then numerator =  $x - 5$

and fraction =  $\frac{x-5}{x}$

According to the condition,

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

$$\Rightarrow \frac{x-2}{x+3} = \frac{4}{5}$$

$$\Rightarrow 5(x-2) = 4x + 12 \quad (\text{By cross multiplication})$$

$$\Rightarrow 5x - 10 = 4x + 12$$

$$\Rightarrow x = 12 + 10$$

$$\Rightarrow x = 22$$

$$\therefore \text{Original fraction} = \frac{x-5}{x}$$

$$= \frac{22-5}{22} = \frac{17}{22}$$

10. Let present age of son =  $x$  year.

Then age of his father =  $2x$ .

8 years hence,

Age of son =  $(x + 8)$  years and age of father =  $(2x + 8)$

According to the condition,

$$\frac{2x+8}{x+8} = \frac{7}{4}$$

$$\Rightarrow 8x + 32 = 7x + 56$$

$$\Rightarrow 8x - 7x = 56 - 32$$

$$\Rightarrow x = 24$$

Present age of son = 24 years

and age of father =  $2x = 2 \times 24 = 58$  years.

Hence age of man = 48 years and age of his son = 24 years.