

Linear Equations In One Variable

QUESTIONS

1. In the set of three consecutive natural numbers, the sum of the last two numbers is equal to the three times the first number. Find the sum of all the three numbers
(a) 12 (b) 14 (c) 16 (d) 18
2. If the value of $3 + 2x$ is equal to $3 - 2x$, then the value of $5 + 3x$ is
(a) 0 (b) 2 (c) 3 (d) 5
3. The sum of five consecutive natural numbers is 65. Find the mid number
(a) 26 (b) 30 (c) 13 (d) 32
4. Twelve years hence Ravi's age will be nine times his age twelve years ago. find the present age of Ravi's
(a) 12 years (b) 15 years (c) 18 years (d) 20 years
5. Find x, if $\frac{3}{x+8} = \frac{4}{6-x}$
(a) 1 (b) 2 (c) -2 (d) 4
6. Solve $\frac{3x+4}{x+1} = \frac{3x+2}{x-1}, x \neq 1$
(a) $1/2$ (b) $-3/2$ (c) $3/2$ (d) 1
7. Solve $\frac{x}{7} + \frac{x}{6} = x - 3$ and find value of x
(a) 1 (b) 6 (c) $126/29$ (d) 18
8. Two number are in the ratio 3 : 8. If the sum of the number is 165, then find the numbers
(a) 65,100 (b) 55,110 (c) 45,120 (d) 35,130
9. A boy travels a distance 25 km, in 4 hours partly on foot at rate 3.5 km/hr and partly on cycle at 9 km/hr. Find the distance on foot.
(a) 5 km (b) 7 km (c) 6 km (d) 8 km
10. A father's age is 7 times as old as his son. Two year ago, the father was 13 times as old as his son. What are their present ages? (Son and father respectively)
(a) 6, 24 (b) 8, 32 (c) 4, 28 (d) 9, 36
11. A rectangular box has a length $(5P - 6)m$ and breadth is $(P + 4)m$. What is the breadth of the box, if its perimeter is 20 m
(a) 2 (b) 4 (c) 6 (d) 8
12. Hussain weight $1\frac{1}{4}$ times more than Rahul If their total mass is 90 kg, what is Hussain is mass
(a) 90 (b) 50 kg (c) 40 (d) 20 kg

13. Reema bought x pens at Rs 2.60 each and y greeting cards at 80 paise each. If the pens costs Rs. 12 more than the cards, the equation involving x and y is
 (a) $13x - 4y = 6$ (b) $13x - 4y = 60$ (c) $260x - 8y = 100$ (d) $260x - 8y = 12$
14. The result of dividing a number of two digits by the number with digits reversed is $\frac{5}{6}$. If the difference of digits is 1, find the number.
 (a) 45 (b) 65 (c) 87 (d) 67
15. If the length and breadth of a room are increased by 1 m each, its area is increased by 21 m^2 . If the length is increased by 1 m and breadth decreased by 1 m, the area is decreased by 5 m^2 . Find the area of the room.
 (a) 96 m^2 (b) 108 m^2 (c) 90 m^2 (d) 60 m^2
16. The sum of two numbers is 69 and their difference is 17. Find the numbers.
 (a) 43, 26 (b) 46, 23 (c) 51, 18 (d) 52, 17
17. A two digit number is seven times the sum of its digits. The number formed by reversing the digits is 18 less than the original number. Find the original number.
 (a) 86 (b) 64 (c) 75 (d) 42
18. If the numerator of a fraction is increased by 2 and denominator decrease by 1, then it becomes $\frac{2}{3}$. If the numerator is increased by 1 and denominator increased by 2, then it becomes $\frac{1}{3}$. Find the fraction.
 (a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{4}{7}$
19. Five years hence, a man's age will be three times his son's age and five years ago, he was seven times as old as his son. Find their present ages.
 (a) 36, 9 (b) 40, 10 (c) 48, 12 (d) 60, 15
20. If $\frac{3x-4}{3} + \frac{5x+2}{2} = \frac{x}{6} + 3$, then $x =$ ____
 (a) 1 (b) 2 (c) 3 (d) 4
21. If $0.3(x-1) - 0.5(2x-1) = 0.6$, then $x =$ ____
 (a) -2 (b) $-\frac{4}{7}$ (c) -3 (d) -1
22. Find the value of y , if $\frac{3y-1}{5} + \frac{y-1}{2} = 3 + \frac{1+y}{2}$
 (a) 5 (b) 6 (c) 7 (d) 8
23. One third of a number is 8 less than the number. Find the number
 (a) 18 (b) 15 (c) 9 (d) 12
24. Four-fifth of number is more than three-fourth of the number by 4. Find the number
 (a) 20 (b) 60 (c) 80 (d) 100

25. Find the value of x and y in the given equation $\frac{x}{a} + \frac{y}{b} = a + b, \frac{x}{a^2} + \frac{y}{b^2} = 2$
- (a) $x = a, y = b$ (b) $x = a^2, y = b^2$ (c) $x = 3a, y = b$ (d) $x = a, y = 2b$
26. Find the number which when added to the numerator and denominator of the ratio 11 : 23, makes it equal to the ratio 4 : 7?
- (a) 5 (b) 10 (c) 15 (d) 20
27. 120 men had provision of food for 200 days, after 5 days, 30 men died due to expediency (i.e. due to some other immediate cause). How long will the remaining food last?
- (a) 250 days (b) 300 days (c) 200 day (d) 260 days
28. Find the solution of
- $$\frac{4y+1}{3} + \frac{2y-1}{2} - \frac{3y-7}{5} = 6$$
- (a) 1 (b) $-2\frac{11}{4}$ (c) $-\frac{11}{4}$ (d) $2\frac{3}{4}$
29. Solve the equation
- $$\frac{0.5(z-0.4)}{3.5} - \frac{0.6(z-2.7)}{4.2} = z + 6.1$$
- (a) $-\frac{202}{35}$ (b) $\frac{202}{35}$ (c) $\frac{35}{202}$ (d) $-\frac{35}{202}$
30. Find the value of 'm' from the expression
- $$\frac{6m^2+13m-4}{2m+5} = \frac{12m^2+5m-2}{4m+3}$$
- (a) -1 (b) 1 (c) 0 (d) 10
31. If $\frac{x-6}{x-2} + \frac{x-3}{x-8} = 2$, then the value of x=?
- (a) -22 (b) 11 (c) 11 (d) 22
32. 60 is divided into two parts such that the sum of their reciprocals is $\frac{3}{25}$. What is the value of larger number?
- (a) 10 (b) 50 (c) 25 (d) 20
33. Three consecutive numbers such that thrice the first, 4 times the second and twice the third together make 188. Find the least of the consecutive numbers.
- (a) 18 (b) 21 (c) 19 (d) 20
34. A man is four times as old as his son. After 2 years the man will be three times as old as his son. What is the present age of the man?
- (a) 20 years (b) 16 years (c) 4 years (d) 24 years

35. A student was asked to find the value of $\frac{3}{7}$ of a sum of money. The student made a mistake by dividing the sum by $\frac{3}{7}$ and then got an answer which exceeded the correct answer by Rs. 80. The correct answer for $\frac{3}{7}$ of sum of money is:-
- (a) Rs. 42 (b) Rs. 24 (c) Rs. 81 (d) Rs. 18
36. A positive number, when increased by 10 equals 200 times its reciprocal. What is number?
- (a) 100 (b) 10 (c) 20 (d) 200
37. If the sum of a number and its reciprocal is $\frac{10}{3}$, then the numbers are
- (a) $3, \frac{1}{3}$ (b) $3, -\frac{1}{3}$ (c) $-3, \frac{1}{3}$ (d) $-3, -\frac{1}{3}$
38. The sum of two numbers is 7 and their product is 12. What is the sum of their reciprocals?
- (a) $\frac{1}{12}$ (b) $\frac{1}{7}$ (c) $\frac{7}{12}$ (d) $\frac{7}{15}$
39. On children's day, sweets were to be equally distributed among 160 children in a school. Actually on the children's day 40 children were absent and therefore each child got 10 sweets extra. Total number of sweets were
- (a) 3200 (b) 2400 (c) 4000 (d) 4800
40. In an examination, a student scores 4 marks for every correct answer and loses 1 mark for every wrong answer. If he attempts in all 40 questions and scored 120 marks, the number of questions he attempts incorrectly is: -
- (a) 8 (b) 32 (c) 16 (d) 12

ANSWER - KEY

1. (a)	2. (d)	3. (c)	4. (b)	5. (c)	6. (b)	7. (c)	8. (c)	9. (b)	10. (c)
11. (c)	12. (b)	13. (b)	14. (a)	15. (a)	16. (a)	17. (d)	18. (b)	19. (b)	20. (a)
21. (b)	22. (c)	23. (d)	24. (c)	25. (b)	26. (a)	27. (d)	28. (d)	29. (a)	30. (b)
31. (a)	32. (b)	33. (d)	34. (b)	35. (d)	36. (b)	37. (a)	38. (c)	39. (d)	40. (a)

Answers and Solutions

1. (a): Let three nos. be $(a-1)$, a , $(a+1)$

$$\therefore a + (a+1) - 3(a-1)$$

$$\Rightarrow 2a + 1 = 3a - 3$$

$$\Rightarrow 4 - a$$

$$\Rightarrow \text{sum} = 12$$

2. (d): $3 + 2x - 3 - 2x$

$$\Rightarrow x = 0$$

$$\Rightarrow 5 + 3x - 5$$

3. (c): $(a-2) + (a-1) + a + (a+1) + (a+2) = 65$

$$\Rightarrow 5a = 65 \Rightarrow a = 13$$

4. (b): Let age on today = x

$$\Rightarrow (x+12) = 9(x-12)$$

$$\Rightarrow 12 + 108 = 8x$$

$$\Rightarrow x = \frac{120}{8} = 15$$

5. (c): $\frac{3}{x+8} = \frac{4}{6-x}$

$$\Rightarrow 18 - 3x = 4x + 32$$

$$\Rightarrow -14 = 7x$$

$$\Rightarrow x = -2.$$

6. (b): $\frac{3x+4}{x+1} = \frac{3x+2}{x-1}, x \neq 1$

$x \neq 1$ is written in order to make the question complete, as if $x = 1$ then $\frac{3x+2}{x-1} = \frac{3x+2}{0} = \text{undefined}$

Now solving $(3x+4)(x-1) = (3x+2)(x+1)$

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

$$\Rightarrow -6 = 4x \Rightarrow x = \frac{-3}{2}$$

7. (c): $\frac{x}{7} + \frac{x}{6} = x - 3$

$$\Rightarrow \frac{13x}{42} = x - 3$$

$$\Rightarrow 13x = 42x - 126$$

$$\Rightarrow 126 = 29x$$

$$\Rightarrow x = \frac{126}{29}$$

8. (c): $3x + 8x = 165$

$$\Rightarrow x = 15$$

Now are 45, 120.

9. (b): Let 'x' hrs on foot, (4-x) hrs on cycle

$$\text{Distance on foot} = 3.5 \times x$$

$$\text{Distance on cycle} = 9 \times (4 - x)$$

$$\Rightarrow 3.5x + 9(4 - x) = 25$$

$$\Rightarrow 36 - 5.5x = 25$$

$$\Rightarrow x = 2$$

$$\therefore 3.5x = 7 \text{ km on foot.}$$

10. (c): x & y be ages

$$\text{Then, } x = 7y$$

$$(x - 2) = 13(y - 2)$$

$$\Rightarrow 7y - 2 = 13y - 26$$

$$\Rightarrow 24 = 6y = y = 4$$

$$\therefore x = 28.$$

11. (c): $2[(5P - 6) + (P + 4)] = 20$

$$\Rightarrow 6P - 2 = 10$$

$$\Rightarrow p = 2$$

$$\therefore 5P - 6 = 4 \text{ \& } P + 4 = 6 = \text{breadth}$$

12. (b): Let Kabul's mass be x

$$x + \frac{5}{4}x = 90$$

$$\Rightarrow x = 40$$

$$\therefore \frac{5x}{4} = 50$$

- 13.** (b) : 'x' pens 'y' greeting cards
 Cost of all greetings card be $0.8y$
 Cost of all pen = $2.6x$
 $\Rightarrow 2.6 \times 0.8y + 12$
 $\Rightarrow 26x - 8y = 120$
 $\Rightarrow 13x - 4y = 60.$

- 14.** (a): Let "ab" be
 $\Rightarrow No = 10a + b$
 Now $\frac{10a+b}{10b+a} = \frac{5}{6}$
 $\Rightarrow 60a + 6b = 50b + 5a$
 $\Rightarrow 55a = 44b$
 $\Rightarrow 5a = 4b$
 also, $b - a = 1$
 $\Rightarrow 5a = 4(a + 1)$
 $\Rightarrow a = 4 \text{ \& } b = 5$
 \therefore Number = 45.

- 15.** (a): $(\text{length} + 1)(\text{breadth} + 1) = A + 2 \text{ length} \quad (1+1)(b-1) = A-5$
 $1b + 1 + b + 1 = A + 21 \quad \dots(I)$
 $1b - 1 + b - 1 = A - 5 \quad \dots(II)$

- 16.** (a): $x + y = 69$
 $x - y = 17$
 $\Rightarrow x = 43, y = 26.$

- 17.** (d): $10a + b = 7(a + b)$

$$\Rightarrow 3a = 6b \Rightarrow a = 2b$$

$$10b + a \text{ or } 10b + 2b = (10a + b) - 18$$

$$\text{Or } 12b = (20b + b) - 18$$

$$\text{Or } 18 = 9b \Rightarrow b = 2; a = 4$$

$$\Rightarrow 7(a + b) = 42.$$

$$18. \quad (b): \frac{a+2}{b-1} = \frac{2}{3}$$

$$\frac{a+1}{b+2} = \frac{1}{3}$$

$$\Rightarrow a = 2, b = 7$$

$$19. \quad (b): (x+5) = 3(y+5)$$

$$\text{and } (x-5) = 7(y-5)$$

$$\Rightarrow x = 40, y = 10$$

$$20. \quad (a): \frac{3x-4}{3} + \frac{5x+2}{2} = \frac{x}{6} + 3$$

$$\Rightarrow x - \frac{4}{3} + \frac{5}{2}x + 1 = \frac{x}{6} + 3$$

$$\Rightarrow x + \frac{5}{2} - \frac{x}{6} = 2 + \frac{4}{3}$$

$$\Rightarrow \frac{6x + 15x - x}{6} = \frac{10}{3}$$

$$\Rightarrow 20x = 20 \Rightarrow x = 1.$$

$$21. \quad (b): 0.3x - 0.3 - x + 0.5 = 0.6$$

$$\therefore -0.7x = 0.4$$

$$x = \frac{-4}{7}$$

$$22. \quad (c) \frac{2(3y-1) + 5(y-1)}{10} = \frac{30 + 5(1+y)}{10}$$

$$\Rightarrow 6y - 2 + 5y - 5 = 30 + 5 + 5y$$

$$\Rightarrow 6y = 42$$

$$y = 7$$

23. (d): $\frac{x}{3} = x - 8$

$$\Rightarrow x = 12.$$

24. (c): $\frac{4}{5}x = \frac{3}{4}x + 4$

$$\Rightarrow x = 80.$$

25. (b): $\frac{x}{a} + \frac{y}{b} = a + b$

$$\frac{x}{a^2} + \frac{y}{b^2} = 2$$

Solving for x, y, we get $x = a^2$, $y = b^2$.

26. (a): $\frac{11+n}{23+n} = \frac{4}{7}$

$$\Rightarrow 77 + 7n = 92 + 4n$$

$$\Rightarrow 3n = 15$$

$$n = 5$$

27. (d): food available for 120×200 man days

In 5 days, food exhausted = 120×5 man days \Rightarrow food left = 120×195 man days

But men left = 90

$$\Rightarrow \text{days food can last} = \frac{120 \times 195}{90} = 4 \times 65$$

$$\Rightarrow 260 \text{ days.}$$

28. (d): Take LCM & solve

29. (a): Take LCM & solve

30. (b): Take LCM & solve

31. (a): Take LCM & solve

32. (b): Let part be x, 60-x

$$\frac{1}{x} + \frac{1}{60-x} = \frac{3}{25}$$

Take LCM to get quadratic; solving we get $x = 10$

$$\therefore 60 - x = 50 = \text{larger no.}$$

33. (d): $3(a-1) + 4a + 2(a+1) = 188$

$$\Rightarrow 9a - 3 + 2 = 188$$

$$\Rightarrow 9a = 189$$

$$\Rightarrow a = 21$$

$$a - 1 = 20 \text{ (ans).}$$

34. (b): $x = 4y$

$$x + 2 = 3(y + 2)$$

$$\text{Solving, } x = 16 : y = 4$$

35. (d): Let sum be 'x'

$$\text{Now, } \frac{x}{3/7} - \frac{3}{7} \times x = 80$$

$$\Rightarrow \frac{7x}{3} - \frac{3x}{7} = 80$$

$$\Rightarrow 40x = 1680$$

$$x = 42$$

$$\therefore \frac{3}{7}x = 18.$$

36. (b): Let no. be x

$$x + 10 = 200 \times \frac{1}{x}$$

$$\text{Solve quadratic to get } x = 10.$$

37. (a): $x + \frac{1}{x} = \frac{10}{3}$

$$\text{Solve quadratic to get } x = 3.$$

38. (c): $x + y = 7 \quad \dots(1)$

$$xy = 12 \quad \dots(2)$$

$$\text{Dividing (1) \& (2)}$$

$$\frac{x+y}{xy} = \frac{7}{12}$$

$$\text{Or } \frac{1}{x} + \frac{1}{y} = \frac{7}{12} \text{ (ANS)}$$

39. (d): Let total sweets be 'n'

Students were supplied to get 'x' sweets

$$160x = n$$

But actually $120(x + 10) = n$

$$\Rightarrow \frac{120}{160}n = \frac{3}{4}n$$

$$\Rightarrow \frac{3n}{4} + 1200 = n$$

$$n = 4800.$$

40. (a): Let correctly attempted Q's be n

Incorrectly attempted Q's = $40 - n$

$$\Rightarrow n \times 4 + (40 - n)(-1) = 120$$

$$\Rightarrow 4n - (40 - n) = 120$$

$$\Rightarrow 5n - 40 = 120$$

$$\Rightarrow 5n = 160$$

$$n = 32$$

$$\Rightarrow 40 - n = 8.$$