

# MATH LOVE INSTITUTE

Annual Examination 2025-26

Class: VII | Subject: Mathematics

Time: 3 Hours | Maximum Marks: 80

Math Love Institute | Raipur, CG | Indore, MP | [www.mathlove.in](http://www.mathlove.in) | +91 7869553517

<b>Student Name:</b>	_____
<b>Roll Number:</b>	_____
<b>Date:</b>	_____

## General Instructions:

1. All questions are compulsory.
2. The question paper is divided into 5 sections: A, B, C, D, and E.
3. Section A: Multiple Choice Questions (1 mark each) - 15 marks
4. Section B: Fill in the Blanks / True-False (1 mark each) - 15 marks
5. Section C: Short Answer Questions (2 marks each) - 20 marks
6. Section D: Long Answer Questions (3 marks each) - 15 marks
7. Section E: Application Based Questions (5 marks each) - 15 marks
8. There is no negative marking.
9. Use of calculators is not allowed.
10. Show all necessary working clearly.

Covering Topics: Ch 8: Rational Numbers | Ch 3: Data Handling | Ch 7: Comparing Quantities | Ch 9: Perimeter and Area | Ch 11: Exponents and Powers | Ch 10: Algebraic Expressions | Ch 13: Visualising Solid Shapes

**SECTION A - MULTIPLE CHOICE QUESTIONS (15 × 1 = 15 marks)**

**Q1.** Which of the following is a rational number? **[1 mark]**

- (a)  $\sqrt{2}$
- (b)  $\pi$
- (c)  $\frac{5}{7}$
- (d)  $\sqrt{3}$

**Q2.** The standard form of the rational number  $-\frac{36}{48}$  is: **[1 mark]**

- (a)  $-\frac{3}{4}$
- (b)  $\frac{3}{4}$
- (c)  $-\frac{9}{12}$
- (d)  $\frac{9}{12}$

**Q3.** In a double bar graph, we compare: **[1 mark]**

- (a) Two different sets of data
- (b) Only one set of data
- (c) Three sets of data
- (d) None of these

**Q4.** If the ratio of two numbers is 3:5 and the smaller number is 15, then the larger number is: **[1 mark]**

- (a) 20
- (b) 25
- (c) 30
- (d) 35

**Q5.** To convert a percentage to a fraction, we divide by: **[1 mark]**

- (a) 10
- (b) 100
- (c) 1000
- (d) 50

- Q6.** The perimeter of a square with side 8 cm is: [1 mark]
- (a) 16 cm
  - (b) 24 cm
  - (c) 32 cm
  - (d) 64 cm
- Q7.** The area of a circle with radius 7 cm is: (Take  $\pi = 22/7$ ) [1 mark]
- (a) 44 cm<sup>2</sup>
  - (b) 88 cm<sup>2</sup>
  - (c) 154 cm<sup>2</sup>
  - (d) 308 cm<sup>2</sup>
- Q8.** The value of  $2^5$  is: [1 mark]
- (a) 10
  - (b) 16
  - (c) 25
  - (d) 32
- Q9.** Using laws of exponents,  $3^4 \times 3^2$  is equal to: [1 mark]
- (a)  $3^6$
  - (b)  $3^8$
  - (c)  $9^6$
  - (d)  $9^8$
- Q10.** The value of any number raised to the power 0 is: [1 mark]
- (a) 0
  - (b) 1
  - (c) The number itself
  - (d) Infinity
- Q11.** In the expression  $5x^2 + 3x - 7$ , the coefficient of  $x^2$  is: [1 mark]
- (a) 2
  - (b) 3
  - (c) 5
  - (d) -7

**Q12.** An algebraic expression with three terms is called: **[1 mark]**

- (a) Monomial
- (b) Binomial
- (c) Trinomial
- (d) Polynomial

**Q13.** The number of vertices in a cube is: **[1 mark]**

- (a) 6
- (b) 8
- (c) 10
- (d) 12

**Q14.** A net for a 3D shape is: **[1 mark]**

- (a) A 2D pattern that can be folded to form the 3D shape
- (b) A 3D model
- (c) A solid shape
- (d) None of these

**Q15.** Which of the following is NOT a formula for finding area? **[1 mark]**

- (a) Area of rectangle = length  $\times$  breadth
- (b) Area of triangle =  $\frac{1}{2} \times$  base  $\times$  height
- (c) Area of square = side  $\times$  side
- (d) Area of circle =  $2\pi r$

<b>SECTION B - FILL IN THE BLANKS / TRUE-FALSE (15 <math>\times</math> 1 = 15 marks)</b>
--

**Part I: Fill in the Blanks (10 questions)**

**Q16.** Every integer is a \_\_\_\_\_ number. **[1 mark]**

**Q17.** The reciprocal of  $\frac{3}{7}$  is \_\_\_\_\_. **[1 mark]**

**Q18.** The mean of the data 5, 8, 10, 12, 15 is \_\_\_\_\_. **[1 mark]**

**Q19.** 25% of 80 is equal to \_\_\_\_\_. **[1 mark]**

**Q20.** The circumference of a circle with radius  $r$  is given by the formula \_\_\_\_\_ . [1 mark]

**Q21.** The area of a parallelogram is equal to \_\_\_\_\_  $\times$  height. [1 mark]

**Q22.** The standard form of 125000 is  $1.25 \times 10$  raised to the power \_\_\_\_\_ . [1 mark]

**Q23.** The sum of  $3x + 5$  and  $2x - 3$  is \_\_\_\_\_ . [1 mark]

**Q24.** A cube has \_\_\_\_\_ faces. [1 mark]

**Q25.** The number of edges in a triangular prism is \_\_\_\_\_ . [1 mark]

**Part II: True or False (5 questions)**

**Q26.** Every rational number can be represented on a number line. [1 mark]  
(True/False)

**Q27.** A double bar graph is used to compare two sets of related data. [1 mark]  
(True/False)

**Q28.** The ratio 2:3 is the same as 4:9. (True/False) [1 mark]

**Q29.** The area of a triangle is always equal to base  $\times$  height. (True/False) [1 mark]

**Q30.**  $(-2)^3 = -8$ . (True/False) [1 mark]

**SECTION C - SHORT ANSWER QUESTIONS (10  $\times$  2 = 20 marks)**

**Q31.** Find three rational numbers between  $1/4$  and  $1/2$ . [2 marks]

**Q32.** Add:  $3/5 + (-2/7)$  [2 marks]

**Q33.** The marks obtained by 5 students in Mathematics are: 75, 82, 90, 68, 85. Find the mean marks. [2 marks]

**Q34.** Convert the following percentages to fractions in their simplest form: **[2 marks]**

(i) 45% (ii) 75%

**Q35.** Find the percentage of marks obtained by a student who scored **[2 marks]**

432 marks out of 600.

**Q36.** Find the perimeter of a rectangle with length 15 cm and breadth 8 **[2 marks]**

cm.

**Q37.** Find the area of a triangle with base 12 cm and height 9 cm. **[2 marks]**

**Q38.** Simplify using laws of exponents:  $(2^3)^4$  **[2 marks]**

**Q39.** Express 729 as a power of 3. **[2 marks]**

**Q40.** Add the following algebraic expressions:  $7x^2 - 5x + 3$  and  $4x^2 + 2x -$  **[2 marks]**

1

**SECTION D - LONG ANSWER QUESTIONS (5 × 3 = 15 marks)**

**Q41.** Multiply:  $\frac{2}{3} \times (-\frac{5}{7}) \times \frac{21}{10}$ . Show all steps clearly. **[3 marks]**

**Q42.** The following table shows the marks obtained by students in first **[3 marks]**

and second term examinations:

Subject	First Term	Second Term
English	60	75
Mathematics	80	85
Science	70	65

Draw a double bar graph to represent this data using an appropriate scale.

**Q43.** The cost price of an article is ₹450 and it was sold for ₹540. Find: **[3 marks]**

- (i) Profit
- (ii) Profit percentage

**Q44.** A rectangular garden is 25 m long and 18 m wide. A path 2 m wide **[3 marks]** is to be built all around it on the outside. Find:

- (i) The area of the garden
- (ii) The area of the path

**Q45.** Simplify:  $(5^2)^3 \times 5^4 \div 5^7$ . Show all steps using laws of exponents. **[3 marks]**

<b>SECTION E - APPLICATION BASED QUESTIONS (3 × 5 = 15 marks)</b>
---

**Q46.** A farmer wants to fence his rectangular field which is 75 m long and **[5 marks]** 50 m wide. He also wants to divide it into two equal parts with a fence running parallel to the breadth.

- (i) Find the total length of fencing required.
- (ii) If the cost of fencing is ₹85 per meter, find the total cost.
- (iii) Find the area of each half of the field.

**Q47.** In a class test, the marks obtained by students are as follows: **[5 marks]**

15, 18, 22, 25, 28, 30, 32, 35, 38, 40

- (i) Find the mean marks.
- (ii) How many students scored above the mean?
- (iii) What percentage of students scored 30 or more marks?

**Q48.** A circular park has a radius of 21 meters. There is a 7-meter wide **[5 marks]** path running around it on the outside.

(Take  $\pi = 22/7$ )

- (i) Find the area of the park.
  - (ii) Find the area of the path.
  - (iii) If the cost of paving the path is ₹50 per  $m^2$ , find the total cost.
-

## DETAILED SOLUTIONS

MATH LOVE INSTITUTE

© 2025 -

CONFIDENTIAL

## SECTION A - MULTIPLE CHOICE QUESTIONS - ANSWERS

**Q1. Answer: (c) 5/7**

**Explanation:** A rational number is a number that can be expressed in the form  $p/q$  where  $p$  and  $q$  are integers and  $q \neq 0$ . The number  $5/7$  fits this definition.  $\sqrt{2}$ ,  $\pi$ , and  $\sqrt{3}$  are irrational numbers as they cannot be expressed as fractions.

*Marking: 1 mark for correct answer*

**Q2. Answer: (a) -3/4**

**Explanation:** To find the standard form, we divide both numerator and denominator by their HCF.

HCF of 36 and 48 = 12

$$-36/48 = (-36 \div 12)/(48 \div 12) = -3/4$$

*Marking: 1 mark for correct answer*

**Q3. Answer: (a) Two different sets of data**

**Explanation:** A double bar graph is used to compare two sets of related data side by side. For example, comparing marks in first term and second term examinations.

*Marking: 1 mark for correct answer*

**Q4. Answer: (b) 25**

**Explanation:** Let the larger number be x.

$$\text{Given: } 3:5 = 15:x$$

$$3/5 = 15/x$$

$$3x = 15 \times 5$$

$$3x = 75$$

$$x = 25$$

*Marking: 1 mark for correct answer*

**Q5. Answer: (b) 100**

**Explanation:** To convert a percentage to a fraction, we divide the percentage by 100. For example,  $25\% = 25/100 = 1/4$

*Marking: 1 mark for correct answer*

**Q6. Answer: (c) 32 cm**

**Explanation:** Perimeter of a square =  $4 \times \text{side}$

$$= 4 \times 8$$

$$= 32 \text{ cm}$$

*Marking: 1 mark for correct answer*

**Q7. Answer: (c) 154 cm<sup>2</sup>**

**Explanation:** Area of circle =  $\pi r^2$

$$= 22/7 \times 7 \times 7$$

$$= 22 \times 7$$

$$= 154 \text{ cm}^2$$

*Marking: 1 mark for correct answer*

**Q8. Answer: (d) 32**

**Explanation:**  $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

*Marking: 1 mark for correct answer*

**Q9. Answer: (a)  $3^6$**

**Explanation:** Using the law of exponents:  $a^m \times a^n = a^{m+n}$

$$3^4 \times 3^2 = 3^{4+2} = 3^6$$

*Marking: 1 mark for correct answer*

**Q10. Answer: (b) 1**

**Explanation:** Any non-zero number raised to the power 0 equals 1. This is a fundamental law of exponents:  $a^0 = 1$

*Marking: 1 mark for correct answer*

**Q11. Answer: (c) 5**

**Explanation:** In the expression  $5x^2 + 3x - 7$ , the coefficient of  $x^2$  is the number that multiplies  $x^2$ , which is 5.

*Marking: 1 mark for correct answer*

**Q12. Answer: (c) Trinomial**

**Explanation:** An algebraic expression with one term is a monomial, two terms is a binomial, and three terms is a trinomial.

Marking: 1 mark for correct answer

**Q13. Answer: (b) 8**

**Explanation:** A cube has 8 vertices (corners), 6 faces, and 12 edges.

Marking: 1 mark for correct answer

**Q14. Answer: (a) A 2D pattern that can be folded to form the 3D shape**

**Explanation:** A net is a two-dimensional pattern that can be folded to form a three-dimensional solid shape.

Marking: 1 mark for correct answer

**Q15. Answer: (d) Area of circle =  $2\pi r$**

**Explanation:** The formula  $2\pi r$  gives the circumference of a circle, not the area. The correct formula for area of a circle is  $\pi r^2$ .

Marking: 1 mark for correct answer

## SECTION B - FILL IN THE BLANKS / TRUE-FALSE - ANSWERS

### Q16. Answer: rational

**Explanation:** Every integer can be expressed in the form  $p/q$  where  $q = 1$ . For example,  $5 = 5/1$ . Therefore, every integer is a rational number.

*Marking: 1 mark for correct answer*

### Q17. Answer: $7/3$

**Explanation:** The reciprocal of a fraction  $a/b$  is  $b/a$ . So the reciprocal of  $3/7$  is  $7/3$ .

*Marking: 1 mark for correct answer*

### Q18. Answer: 10

**Explanation:** Mean = Sum of all observations  $\div$  Number of observations  
 $= (5 + 8 + 10 + 12 + 15) \div 5$   
 $= 50 \div 5$   
 $= 10$

*Marking: 1 mark for correct answer*

### Q19. Answer: 20

**Explanation:** 25% of 80 =  $25/100 \times 80 = 1/4 \times 80 = 20$

*Marking: 1 mark for correct answer*

**Q20. Answer:  $2\pi r$**

**Explanation:** The circumference (perimeter) of a circle is given by the formula  $2\pi r$ , where  $r$  is the radius.

*Marking: 1 mark for correct answer*

**Q21. Answer: base**

**Explanation:** Area of a parallelogram = base  $\times$  height

*Marking: 1 mark for correct answer*

**Q22. Answer: 5**

**Explanation:**  $125000 = 1.25 \times 100000 = 1.25 \times 10^5$

*Marking: 1 mark for correct answer*

**Q23. Answer:  $5x + 2$**

**Explanation:**  $(3x + 5) + (2x - 3) = 3x + 2x + 5 - 3 = 5x + 2$

*Marking: 1 mark for correct answer*

**Q24. Answer: 6**

**Explanation:** A cube has 6 square faces, 8 vertices, and 12 edges.

*Marking: 1 mark for correct answer*

**Q25. Answer: 9**

**Explanation:** A triangular prism has 2 triangular faces and 3 rectangular faces. It has 6 vertices and 9 edges.

*Marking: 1 mark for correct answer*

**Q26. Answer: True**

**Explanation:** Every rational number can be uniquely represented on a number line.

*Marking: 1 mark for correct answer*

**Q27. Answer: True**

**Explanation:** A double bar graph uses two bars side by side to compare two sets of related data.

*Marking: 1 mark for correct answer*

**Q28. Answer: False**

**Explanation:**  $2:3 = \frac{2}{3}$ , while  $4:9 = \frac{4}{9}$ . Since  $\frac{2}{3} \neq \frac{4}{9}$ , these ratios are not the same. (The equivalent ratio of 2:3 would be 4:6 or 6:9)

*Marking: 1 mark for correct answer*

**Q29. Answer: False**

**Explanation:** The area of a triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$ , not  $\text{base} \times \text{height}$ .

*Marking: 1 mark for correct answer*

**Q30. Answer: True**

**Explanation:**  $(-2)^3 = (-2) \times (-2) \times (-2) = -8$

*Marking: 1 mark for correct answer*

## SECTION C - SHORT ANSWER QUESTIONS - ANSWERS

**Q31. Answer: Three rational numbers between  $\frac{1}{4}$  and  $\frac{1}{2}$**

**Solution:**

Method: Convert both fractions to have the same denominator

$$\frac{1}{4} = \frac{5}{20} \text{ and } \frac{1}{2} = \frac{10}{20}$$

Three rational numbers between  $\frac{5}{20}$  and  $\frac{10}{20}$  are:

**$\frac{6}{20}$  (or  $\frac{3}{10}$ ),  $\frac{7}{20}$ ,  $\frac{8}{20}$  (or  $\frac{2}{5}$ )**

Alternatively:  $\frac{1}{4} = \frac{10}{40}$  and  $\frac{1}{2} = \frac{20}{40}$

Numbers could be:  $\frac{11}{40}$ ,  $\frac{12}{40}$  (or  $\frac{3}{10}$ ),  $\frac{13}{40}$

*Marking: 1 mark for method, 1 mark for correct three rational numbers*

**Q32. Answer:  $\frac{3}{5} + (-\frac{2}{7})$**

**Solution:**

Step 1: Find the LCM of 5 and 7 = 35

Step 2: Convert to equivalent fractions:

$$\frac{3}{5} = \frac{(3 \times 7)}{(5 \times 7)} = \frac{21}{35}$$

$$-\frac{2}{7} = \frac{(-2 \times 5)}{(7 \times 5)} = -\frac{10}{35}$$

Step 3: Add the numerators:

$$\frac{21}{35} + (-\frac{10}{35}) = \frac{(21 - 10)}{35} = \frac{11}{35}$$

**Answer: 11/35**

*Marking: 1 mark for finding LCM and converting, 1 mark for correct addition*

**Q33. Answer: Mean marks of 5 students**

**Solution:**

Marks: 75, 82, 90, 68, 85

Mean = Sum of all observations  $\div$  Number of observations

Sum =  $75 + 82 + 90 + 68 + 85 = 400$

Number of students = 5

Mean =  $400 \div 5 = 80$

**Answer: Mean marks = 80**

*Marking: 1 mark for formula and sum, 1 mark for correct mean*

**Q34. Answer: Converting percentages to fractions**

**Solution:**

(i)  $45\% = 45/100 = (45 \div 5)/(100 \div 5) = 9/20$

(ii)  $75\% = 75/100 = (75 \div 25)/(100 \div 25) = 3/4$

**Answers: (i) 9/20 (ii) 3/4**

*Marking: 1 mark for each correct simplified fraction (2 marks total)*

**Q35. Answer: Percentage of marks obtained**

**Solution:**

Marks obtained = 432

Maximum marks = 600

Percentage = (Marks obtained / Maximum marks) × 100

$$= (432/600) \times 100$$

$$= 0.72 \times 100$$

$$= 72\%$$

**Answer: 72%**

*Marking: 1 mark for formula, 1 mark for correct percentage*

**Q36. Answer: Perimeter of rectangle****Solution:**

Length (l) = 15 cm

Breadth (b) = 8 cm

Perimeter = 2(l + b)

$$= 2(15 + 8)$$

$$= 2 \times 23$$

$$= 46 \text{ cm}$$

**Answer: Perimeter = 46 cm**

*Marking: 1 mark for formula, 1 mark for correct perimeter*

**Q37. Answer: Area of triangle**

**Solution:**

Base = 12 cm

Height = 9 cm

Area of triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$

$$= \frac{1}{2} \times 12 \times 9$$

$$= 6 \times 9$$

$$= 54 \text{ cm}^2$$

**Answer: Area = 54 cm<sup>2</sup>**

*Marking: 1 mark for formula, 1 mark for correct area with units*

**Q38. Answer: Simplify  $(2^3)^4$**

**Solution:**

Using the law of exponents:  $(a^m)^n = a^{m \times n}$

$$(2^3)^4 = 2^{3 \times 4} = 2^{12}$$

Or, calculating the value:

$$2^{12} = 4096$$

**Answer:  $2^{12}$  or 4096**

*Marking: 1 mark for applying the law correctly, 1 mark for correct answer*

**Q39. Answer: Express 729 as a power of 3**

**Solution:**

Finding prime factorization of 729:

$$729 = 3 \times 243$$

$$= 3 \times 3 \times 81$$

$$= 3 \times 3 \times 3 \times 27$$

$$= 3 \times 3 \times 3 \times 3 \times 9$$

$$= 3 \times 3 \times 3 \times 3 \times 3 \times 3$$

$$= 3^6$$

**Answer:  $729 = 3^6$**

*Marking: 1 mark for factorization method, 1 mark for correct answer*

**Q40. Answer: Add algebraic expressions****Solution:**

$$= (7x^2 - 5x + 3) + (4x^2 + 2x - 1)$$

$$= 7x^2 + 4x^2 - 5x + 2x + 3 - 1$$

$$= 11x^2 - 3x + 2$$

**Answer:  $11x^2 - 3x + 2$**

*Marking: 1 mark for combining like terms, 1 mark for correct final expression*

## SECTION D - LONG ANSWER QUESTIONS - ANSWERS

**Q41. Answer: Multiply  $\frac{2}{3} \times (-\frac{5}{7}) \times \frac{21}{10}$**

**Solution:**

Step 1: Multiply all numerators and all denominators

$$= [2 \times (-5) \times 21] / [3 \times 7 \times 10]$$

Step 2: Calculate numerator and denominator

$$= (-210) / 210$$

Step 3: Simplify

$$= -1$$

**Alternative method (simplify before multiplying):**

$$= (2 \times (-5) \times 21) / (3 \times 7 \times 10)$$

Cancel 21 and 3  $\rightarrow$  7 remains in numerator

Cancel 7 from numerator and denominator

Cancel 2 and 10  $\rightarrow$  5 remains in denominator

$$= (-5 \times 1 \times 1) / (1 \times 1 \times 5)$$

$$= -5/5 = -1$$

**Answer: -1**

*Marking: 1 mark for multiplying correctly, 1 mark for calculation, 1 mark for correct final*

#### Q42. Answer: Double bar graph for marks comparison

##### Solution:

##### Steps to draw the double bar graph:

1. Draw two perpendicular axes (horizontal and vertical)
2. Mark X-axis for subjects: English, Mathematics, Science
3. Mark Y-axis for marks with scale 1 cm = 10 marks (0, 10, 20, 30, ... 90)
4. For each subject, draw two bars side by side:
  - One for First Term (use one color, e.g., blue)
  - One for Second Term (use another color, e.g., red)

##### Bar Heights:

Subject	First Term Bar Height	Second Term Bar Height
English	6 cm (60 marks)	7.5 cm (75 marks)
Mathematics	8 cm (80 marks)	8.5 cm (85 marks)
Science	7 cm (70 marks)	6.5 cm (65 marks)

5. Add legend/key to show which color represents which term
6. Add title: "Marks Comparison - First Term vs Second Term"

**Observation:** Students improved in English and Mathematics but scored less in Science in the second term.

marks for title and labels (3 marks total)

**Q43. Answer: Find profit and profit percentage**

**Given:**

Cost Price (CP) = ₹450

Selling Price (SP) = ₹540

**Solution:**

(i) **Profit:**

Since  $SP > CP$ , there is a profit

Profit = SP - CP

= 540 - 450

= ₹90

(ii) **Profit Percentage:**

Profit% =  $(\text{Profit}/\text{CP}) \times 100$

=  $(90/450) \times 100$

=  $(1/5) \times 100$

= 20%

**Answers: (i) Profit = ₹90 (ii) Profit% = 20%**

Marking: 1.5 marks for profit calculation, 1.5 marks for profit percentage (3 marks total)

**Q44. Answer: Area of garden and path**

**Given:**

Length of garden = 25 m

Width of garden = 18 m

Width of path = 2 m (all around outside)

**Solution:**

(i) **Area of the garden:**

Area = length  $\times$  breadth

$$= 25 \times 18$$

$$= 450 \text{ m}^2$$

(ii) **Area of the path:**

The path is outside the garden, so:

$$\text{Length including path} = 25 + 2 + 2 = 29 \text{ m}$$

$$\text{Width including path} = 18 + 2 + 2 = 22 \text{ m}$$

$$\text{Total area (garden + path)} = 29 \times 22 = 638 \text{ m}^2$$

Area of path = Total area - Area of garden

$$= 638 - 450$$

$$= 188 \text{ m}^2$$

**Answers: (i) Area of garden = 450 m<sup>2</sup> (ii) Area of path = 188 m<sup>2</sup>**

*Marking: 1 mark for garden area, 2 marks for path area calculation (3 marks total)*

**Q45. Answer: Simplify  $(5^2)^3 \times 5^4 \div 5^7$**

**Solution:**

Step 1: Apply the law  $(a^m)^n = a^{m \times n}$

$$(5^2)^3 = 5^{2 \times 3} = 5^6$$

Step 2: Now the expression becomes:

$$= 5^6 \times 5^4 \div 5^7$$

Step 3: Apply the law  $a^m \times a^n = a^{m+n}$

$$= 5^{6+4} \div 5^7$$

$$= 5^{10} \div 5^7$$

Step 4: Apply the law  $a^m \div a^n = a^{m-n}$

$$= 5^{10-7}$$

$$= 5^3$$

$$= 125$$

**Answer:  $5^3$  or 125**

*Marking: 1 mark for each law applied correctly (3 marks total)*

## SECTION E - APPLICATION BASED QUESTIONS - ANSWERS

### Q46. Answer: Fencing the rectangular field

#### Given:

Length = 75 m

Width (Breadth) = 50 m

Additional fence parallel to breadth to divide into two equal parts

Cost of fencing = ₹85 per meter

#### Solution:

##### (i) Total length of fencing required:

Perimeter of field =  $2(\text{length} + \text{breadth})$

$$= 2(75 + 50)$$

$$= 2 \times 125$$

$$= 250 \text{ m}$$

Additional fence parallel to breadth = 50 m

Total fencing =  $250 + 50 = 300 \text{ m}$

##### (ii) Total cost of fencing:

Cost = Total length  $\times$  Rate per meter

$$= 300 \times 85$$

$$= ₹25,500$$

(iii) **Area of each half of the field:**

Total area of field = length  $\times$  breadth

$$= 75 \times 50$$

$$= 3750 \text{ m}^2$$

$$\text{Area of each half} = 3750 \div 2 = 1875 \text{ m}^2$$

**Answers:**

(i) Total fencing required = 300 m

(ii) Total cost = ₹25,500

(iii) Area of each half = 1875 m<sup>2</sup>

*Marking: 2 marks for total fencing, 1.5 marks for cost, 1.5 marks for area (5 marks total)*

#### **Q47. Answer: Analysis of class test marks**

**Given marks:** 15, 18, 22, 25, 28, 30, 32, 35, 38, 40

**Solution:**

(i) **Mean marks:**

$$\text{Sum of all marks} = 15 + 18 + 22 + 25 + 28 + 30 + 32 + 35 + 38 + 40$$

$$= 283$$

$$\text{Number of students} = 10$$

$$\text{Mean} = 283 \div 10 = 28.3 \text{ marks}$$

(ii) **Students who scored above the mean:**

$$\text{Mean} = 28.3$$

Students scoring above 28.3: 30, 32, 35, 38, 40

Number of students = 5 students

(iii) **Percentage of students scoring 30 or more:**

Students scoring 30 or more: 30, 32, 35, 38, 40 = 5 students

Percentage =  $(5/10) \times 100$

= 50%

**Answers:**

(i) Mean marks = 28.3

(ii) 5 students scored above the mean

(iii) 50% of students scored 30 or more marks

*Marking: 2 marks for mean, 1.5 marks for students above mean, 1.5 marks for percentage (5 marks total)*

**Q48. Answer: Circular park with path**

**Given:**

Radius of park (r) = 21 m

Width of path = 7 m

$\pi = 22/7$

Cost of paving = ₹50 per m<sup>2</sup>

**Solution:**

(i) **Area of the park:**

Area of circle =  $\pi r^2$

$$= 22/7 \times 21 \times 21$$

$$= 22/7 \times 441$$

$$= 22 \times 63$$

$$= 1386 \text{ m}^2$$

(ii) **Area of the path:**

Radius of park including path (R) =  $21 + 7 = 28 \text{ m}$

Area of park with path =  $\pi R^2$

$$= 22/7 \times 28 \times 28$$

$$= 22/7 \times 784$$

$$= 22 \times 112$$

$$= 2464 \text{ m}^2$$

Area of path = Area with path - Area of park

$$= 2464 - 1386$$

$$= 1078 \text{ m}^2$$

(iii) **Total cost of paving the path:**

Cost = Area of path  $\times$  Rate per  $\text{m}^2$

$$= 1078 \times 50$$

$$= ₹53,900$$

**Answers:**

(i) Area of park =  $1386 \text{ m}^2$

(ii) Area of path =  $1078 \text{ m}^2$

(iii) Total cost of paving = ₹53,900

Marking: 1.5 marks for park area, 2 marks for path area, 1.5 marks for cost (5 marks total)

## Marking Summary

Section	Question Type	Total Marks
Section A	Multiple Choice Questions (15 × 1)	15 marks
Section B	Fill in the Blanks / True-False (15 × 1)	15 marks
Section C	Short Answer Questions (10 × 2)	20 marks
Section D	Long Answer Questions (5 × 3)	15 marks
Section E	Application Based Questions (3 × 5)	15 marks
<b>TOTAL</b>		<b>80 marks</b>



### Chapter-wise Marks Distribution:

- **Ch 8: Rational Numbers** - Approx. 18 marks
- **Ch 3: Data Handling** - Approx. 12 marks
- **Ch 7: Comparing Quantities** - Approx. 14 marks
- **Ch 9: Perimeter and Area** - Approx. 16 marks
- **Ch 11: Exponents and Powers** - Approx. 12 marks
- **Ch 10: Algebraic Expressions** - Approx. 6 marks

- **Ch 13: Visualising Solid Shapes** - Approx. 2 marks

## MATH LOVE INSTITUTE

+91 7869553517 | [www.mathlove.in](http://www.mathlove.in)

Raipur, Chhattisgarh | Indore, Madhya Pradesh

© 2025 Math Love Institute. All Rights Reserved.

**Education is the Foundation of Life | शिक्षा ही जीवन का आधार है**

This comprehensive paper covers: Rational Numbers | Data Handling & Double Bar Graphs | Comparing Quantities & Percentages | Perimeter & Area of Geometric Figures | Exponents & Powers | Algebraic Expressions | Visualising Solid Shapes

*Prepared with reference to NCERT Syllabus 2025-26 | All Questions Solved with Step-by-Step Explanations*

MATH LOVE  
© 2025 -  
CONFIDENTIAL