MATH LOVE INSTITUTE

CBSE Class 8 Mathematics

Home Exam 2025-26 - Sample Paper Set 4

Strictly Based on Latest NCERT Syllabus - Class 8 Level Only

Maximum Marks	80
Time Allowed	3 Hours
Class	VIII (Eight)
Subject	Mathematics

📋 GENERAL INSTRUCTIONS:

1. This question paper contains **38 questions** divided into **Five Sections A, B, C, D and E**.
2. **Section A** comprises of 20 MCQs of 1 mark each.
3. **Section B** comprises of 6 questions of 2 marks each.
4. **Section C** comprises of 6 questions of 3 marks each.
5. **Section D** comprises of 3 questions of 5 marks each.
6. **Section E** comprises of 3 case study based questions of 4 marks each (with sub-parts).
7. All questions are **compulsory**. However, internal choices have been provided in some questions.
8. Use of calculator is **NOT** permitted.
9. Draw neat and clean diagrams wherever required.
10. Write all working and steps clearly for better understanding and full marks.

SECTION A - MULTIPLE CHOICE QUESTIONS (1 × 20 = 20 Marks)

Q1. The factorization of $x^2 + 9x + 20$ is: **[1]**

(a) $(x + 4)(x + 5)$

(b) $(x + 10)(x + 2)$

(c) $(x - 4)(x - 5)$

(d) $(x + 1)(x + 20)$

Q2. Using the identity $(a - b)^2 = a^2 - 2ab + b^2$, the value of $(98)^2$ is: **[1]**

(a) 9,604

(b) 9,504

(c) 9,804

(d) 9,704

Q3. The solution of $(5x - 3)/2 = 6$ is: **[1]**

(a) $x = 3$

(b) $x = 15/5$

(c) $x = 3$

(d) $x = 15$

Q4. If an article is sold at a gain of 15%, the selling price is ₹920. The cost price is: **[1]**

(a) ₹750

(b) ₹800

(c) ₹850

(d) ₹900

Q5. The difference between compound interest and simple interest on ₹10,000 at 10% per annum for 2 years is: **[1]**

(a) ₹50

(b) ₹100

(c) ₹150

(d) ₹200

Q6. The area of a parallelogram with base 15 cm and height 8 cm is: **[1]**

(a) 60 cm^2

(b) 100 cm^2

(c) 120 cm^2

(d) 140 cm^2

Q7. The lateral surface area of a cube with edge 6 cm is: **[1]**

(a) 72 cm^2

(b) 108 cm^2

(c) 144 cm^2

(d) 216 cm^2

Q8. In a frequency distribution, the class mark of the class 30-40 is: **[1]**

(a) 30

(b) 35

(c) 40

(d) 70

Q9. In a parallelogram, if one angle is 120°, the adjacent angle is: **[1]**

(a) 40°

(b) 60°

(c) 80°

(d) 120°

Q10. The diagonals of a rectangle are: **[1]**

(a) Equal

(b) Perpendicular bisectors

(c) Unequal

(d) Perpendicular

Q11. The expression $6xy - 9x^2y$ can be factorized as: **[1]**

(a) $3x(2y - 3xy)$

(b) $3xy(2 - 3x)$

(c) $xy(6 - 9x)$

(d) $3x(2y - 3x)$

Q12. If $3(x - 4) = 2x + 5$, then x equals: **[1]**

(a) 11

(b) 13

(c) 15

(d) 17

Q13. A trader allows a discount of 20% and still gains 20%. The marked price is above cost price by: **[1]**

(a) 40%

(b) 45%

(c) 50%

(d) 60%

Q14. The volume of a cuboid with dimensions 10 cm × 8 cm × 5 cm is: **[1]**

(a) 200 cm^3

(b) 300 cm^3

(c) 400 cm^3

(d) 500 cm^3

Q15. The total surface area of a cylinder with radius 7 cm and height 10 cm is (use $\pi = 22/7$): **[1]**

(a) 528 cm^2

(b) 616 cm^2

(c) 704 cm^2

(d) 748 cm^2

Q16. A die is thrown once. The probability of getting an even number is: **[1]**

(a) 1/6

(b) 1/3

(c) 1/2

(d) 2/3

Q17. The sum of angles in a pentagon is: **[1]**

(a) 360°

(b) 450°

(c) 540°

(d) 720°

Q18. Using the identity $(x + a)(x + b) = x^2 + (a + b)x + ab$, the product of $(x + 4)(x + 2)$ is: **[1]**

(a) $x^2 + 6x + 8$

(b) $x^2 + 8x + 6$

(c) $x^2 + 6x + 6$

(d) $x^2 + 8x + 8$

Q19. If selling price = cost price, then: **[1]**

(a) Profit = 10%

(b) Loss = 10%

(c) No profit no loss

(d) Profit = Loss

Q20. The factorization of $16x^2 - 25y^2$ is: **[1]**

(a) $(4x + 5y)(4x - 5y)$

(b) $(16x + 25y)(x - y)$

(c) $(8x + 5y)(2x - 5y)$

(d) $(4x + 5y)^2$

SECTION B - SHORT ANSWER QUESTIONS I (2 × 6 = 12 Marks)

Q21. Factorize by taking common: $12x^3 - 18x^2 + 6x$ **[2]**

Q22. Solve: $4(x + 3) = 5(x - 2)$ **[2]**

Q23. Find the simple interest on ₹12,000 at 9% per annum for 2 years. **[2]**

Q24. Find the perimeter of a rectangle whose length is 15 cm and breadth is 8 cm. **[2]**

Q25. The angles of a quadrilateral are in the ratio 2:3:4:6. Find all the angles. **[2]**

Q26. A bag contains 5 red and 7 blue balls. One ball is drawn at random. Find the probability that the ball drawn is: **[2]**

(i) red

(ii) not blue

SECTION C - SHORT ANSWER QUESTIONS II (3 × 6 = 18 Marks)

Q27. Expand using identity: $(2x - 3y)^2$ **[3]**

Q28. The sum of two consecutive multiples of 7 is 77. Find the numbers. **[3]**

Q29. A shopkeeper buys an article for ₹450 and sells it for ₹540. Find the profit and profit percent. **[3]**

OR

After allowing a discount of 12% on marked price, a trader still gains 10%. If the gain is ₹44, find the marked price.

Q30. A cylindrical pillar has diameter 56 cm and height 3.5 m. Find the curved surface area of the pillar. (Use $\pi = 22/7$) **[3]**

Q31. Draw a histogram for the following frequency distribution: **[3]**

Class Interval	0-10	10-20	20-30	30-40
Frequency	8	12	15	10

Q32. ABCD is a trapezium in which AB || DC. If $\angle A = 70°$ and $\angle B = 80°$, find $\angle C$ and $\angle D$. **[3]**

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

Q33. (a) If $a + b = 10$ and $ab = 24$, find the value of $a^2 + b^2$ **[5]**

(b) Factorize: $25m^2 - 40mn + 16n^2$

OR

Using the identity $(a + b)(a - b) = a^2 - b^2$, evaluate: 105×95

Q34. Five years ago, a man was 7 times as old as his son. Five years hence, the father will be three times as old as his son. Find their present ages. **[5]**

Q35. Find the compound interest on ₹15,625 at 4% per annum for 3 years compounded annually. **[5]**

OR

Maria invested ₹8,000 in a business. She would be paid interest at 5% per annum compounded half-yearly. Find the amount received by Maria at the end of two years.

SECTION E - CASE STUDY BASED QUESTIONS (4 × 3 = 12 Marks + 3 Internal

Choice = 15 Marks)

Q36. **[4]**

CASE STUDY 1: Painting a Room

A room is 8 m long, 6 m wide, and 3 m high. It has two windows each measuring 2 m × 1.5 m and a door measuring 2.5 m × 1.2 m. The room needs to be painted from inside (walls and ceiling). The cost of painting is ₹50 per square meter.

Based on the above information, answer the following questions:

(i) Find the total area of the four walls. **[1 mark]**

(ii) Find the area to be painted (walls + ceiling - windows - door). **[1 mark]**
OR
What is the total cost of painting?

(iii) If painting is done on two coats, what will be the total cost? **[2 marks]**

Q37. **[4]**

CASE STUDY 2: Investment Options

Ramesh has ₹50,000 to invest. He is comparing two banks:

- Bank A: 8% per annum simple interest
- Bank B: 6% per annum compound interest (compounded annually)

He plans to invest for 3 years.

Based on the above information, answer the following questions:

(i) What will be the interest from Bank A? **[1 mark]**

(ii) What will be the amount from Bank B after 3 years? **[1 mark]**

OR

What will be the interest from Bank B?

(iii) Which bank gives better returns and by how much? **[2 marks]**

Q38. **[4]**

CASE STUDY 3: Sports Survey

A survey was conducted among 80 students about their favorite sport. The results are shown in the table:

Sport	Cricket	Football	Basketball	Tennis
Students	32	24	16	8

Based on the above information, answer the following questions:

(i) Which sport is most popular? **[1 mark]**

(ii) What is the central angle for Football in a pie chart? **[1 mark]**
OR
How many students prefer Basketball or Tennis?

(iii) If a student is selected at random, what is the probability they prefer Cricket? **[2 marks]**

📚 END OF QUESTION PAPER 📚

Total Marks: 80

Section A: 20 marks | Section B: 12 marks | Section C: 18 marks

Section D: 15 marks | Section E: 12 marks | Internal Choice: 3 marks

All questions strictly based on NCERT Class 8 syllabus.
Verified against official NCERT curriculum guidelines 2025-26.

🎯 DETAILED ANSWER KEY WITH SOLUTIONS

SECTION A - ANSWERS (1 × 20 = 20 Marks)

Q1. Answer: (a) (x + 4)(x + 5)

Solution:

$x^2 + 9x + 20$

We need two numbers that multiply to 20 and add to 9

Those numbers are 4 and 5

$= (x + 4)(x + 5)$

Q2. Answer: (a) 9,604

Solution:

$(98)^2 = (100 - 2)^2$

Using identity: $(a - b)^2 = a^2 - 2ab + b^2$

$= 100^2 - 2(100)(2) + 2^2$

$= 10,000 - 400 + 4$

$= 9,604$

Q3. Answer: (a) x = 3

Solution:

$(5x - 3)/2 = 6$

$5x - 3 = 12$

$5x = 15$

$x = 3$

Q4. Answer: (b) ₹800

Solution:

S.P. = ₹920, Gain = 15%

S.P. = C.P. + 15% of C.P.

920 = C.P. × 1.15

C.P. = 920/1.15

C.P. = ₹800

Q5. Answer: (b) ₹100

Solution:

P = ₹10,000, R = 10%, T = 2 years

S.I. = (10000 × 10 × 2)/100 = ₹2,000

C.I. = $10000[(1.1)^2 - 1] = 10000[1.21 - 1]$ = ₹2,100

Difference = 2100 - 2000 = ₹100

Q6. Answer: (c) 120 cm^2

Solution:

Area of parallelogram = base × height

= 15 × 8

= 120 cm^2

Q7. Answer: (c) 144 cm^2

Solution:

Lateral surface area of cube = $4a^2$

= 4×6^2

= 4 × 36

= 144 cm^2

Q8. Answer: (b) 35

Solution:

Class mark = (Lower limit + Upper limit)/2

= (30 + 40)/2

= 35

Q9. Answer: (b) 60°

Explanation: Adjacent angles in a parallelogram are supplementary.

Adjacent angle = 180° - 120° = 60°

Q10. Answer: (a) Equal

Explanation: Diagonals of a rectangle are always equal in length.

Q11. Answer: (b) 3xy(2 - 3x)

Solution:

$6xy - 9x^2y$

$= 3xy(2) - 3xy(3x)$

$= 3xy(2 - 3x)$

Q12. Answer: (d) 17

Solution:

$3(x - 4) = 2x + 5$

$3x - 12 = 2x + 5$

$3x - 2x = 5 + 12$

$x = 17$

Q13. Answer: (c) 50%

Solution:

Let C.P. = 100

S.P. = 120 (20% gain)

Discount = 20%, so S.P. = 80% of M.P.

120 = 0.8 × M.P.

M.P. = 150

M.P. is 50% above C.P.

Q14. Answer: (c) 400 cm^3

Solution:

Volume = l × b × h

= 10 × 8 × 5

= 400 cm^3

Q15. Answer: (d) 748 cm^2

Solution:

T.S.A. = $2\pi r(h + r)$

= $2 \times (22/7) \times 7 \times (10 + 7)$

= 44 × 17

= 748 cm^2

Q16. Answer: (c) 1/2

Solution:

Even numbers on a die: 2, 4, 6 = 3 outcomes

Total outcomes = 6

P(even) = 3/6 = 1/2

Q17. Answer: (c) 540°

Solution:

Sum of angles in a polygon = (n - 2) × 180°

For pentagon, n = 5

= (5 - 2) × 180° = 3 × 180° = 540°

Q18. Answer: (a) $x^2 + 6x + 8$

Solution:

(x + 4)(x + 2)

Using identity: $(x + a)(x + b) = x^2 + (a + b)x + ab$

Here a = 4, b = 2

$= x^2 + (4 + 2)x + (4)(2)$

$= x^2 + 6x + 8$

Q19. Answer: (c) No profit no loss

Explanation: When S.P. = C.P., there is no profit and no loss.

Q20. Answer: (a) (4x + 5y)(4x - 5y)

Solution:

$16x^2 - 25y^2 = (4x)^2 - (5y)^2$

Using identity: $a^2 - b^2 = (a + b)(a - b)$

= (4x + 5y)(4x - 5y)

SECTION B - ANSWERS (2 × 6 = 12 Marks)

Q21. Solution:

> **Marking Scheme:** 1 mark for taking out common factor + 1 mark for complete factorization

$12x^3 - 18x^2 + 6x$

$= 6x(2x^2) - 6x(3x) + 6x(1)$

$= 6x(2x^2 - 3x + 1)$

Answer: $6x(2x^2 - 3x + 1)$

Q22. Solution:

> **Marking Scheme:** 1 mark for simplification + 1 mark for solving

$4(x + 3) = 5(x - 2)$

$4x + 12 = 5x - 10$

$12 + 10 = 5x - 4x$

$x = 22$

Q23. Solution:

> **Marking Scheme:** 1 mark for formula + 1 mark for calculation

S.I. $= (P \times R \times T)/100$

$= (12000 \times 9 \times 2)/100$

$= 216000/100$

S.I. = ₹2,160

Q24. Solution:

> **Marking Scheme:** 1 mark for formula + 1 mark for calculation

Perimeter of rectangle = 2(length + breadth)

$= 2(15 + 8)$

= 2 × 23

Perimeter = 46 cm

Q25. Solution:

Marking Scheme: 1 mark for equation + 1 mark for all angles

Let the angles be 2x, 3x, 4x, and 6x

Sum of angles = 360°

2x + 3x + 4x + 6x = 360°

15x = 360°

x = 24°

Angles are:

2x = 48°, 3x = 72°, 4x = 96°, 6x = 144°

48°, 72°, 96°, 144°

Q26. Solution:

Marking Scheme: 1 mark for each part

Total balls = 5 + 7 = 12

(i) P(red):

Red balls = 5

P(red) = 5/12

(ii) P(not blue):

Not blue = Red balls = 5

P(not blue) = 5/12

SECTION C - ANSWERS (3 × 6 = 18 Marks)

Q27. Solution:

> **Marking Scheme:** 1 mark for identifying identity + 2 marks for expansion

$(2x - 3y)^2$

Using identity: $(a - b)^2 = a^2 - 2ab + b^2$

Here $a = 2x$, $b = 3y$

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

$= 4x^2 - 12xy + 9y^2$

Answer: $4x^2 - 12xy + 9y^2$

Q28. Solution:

> **Marking Scheme:** 1 mark for equation + 1 mark for solving + 1 mark for both numbers

Let the first multiple of 7 = $7x$

Then the next consecutive multiple = $7(x + 1) = 7x + 7$

According to question:

$7x + 7x + 7 = 77$

$14x + 7 = 77$

$14x = 70$

$x = 5$

First number = $7 \times 5 = 35$

Second number = $7 \times 6 = 42$

Numbers are: 35 and 42

Q29. Solution:

> **Marking Scheme:** 1 mark for profit + 1 mark for profit% + 1 mark for final answer

C.P. = ₹450

S.P. = ₹540

Profit = S.P. - C.P. = 540 - 450 = ₹90

Profit% = (Profit/C.P.) × 100

= (90/450) × 100

Profit = ₹90, Profit% = 20%

OR

Gain = ₹44

Let C.P. = x

Gain = 10% of x = 0.1x = 44

x = 440

S.P. = C.P. + Gain = 440 + 44 = ₹484

Discount = 12% of M.P.

S.P. = 88% of M.P.

484 = 0.88 × M.P.

M.P. = 484/0.88

M.P. = ₹550

Q30. Solution:

> **Marking Scheme:** 1 mark for converting units + 1 mark for formula + 1 mark for calculation

Diameter = 56 cm, so radius = 28 cm = 0.28 m

Height = 3.5 m

C.S.A. = 2πrh

= 2 × (22/7) × 0.28 × 3.5

= 2 × (22/7) × (28/100) × (35/10)

= 2 × 22 × 4 × 0.05

= 6.16 m²

Or keeping in cm: r = 28 cm, h = 350 cm

C.S.A. = 2 × (22/7) × 28 × 350

= 2 × 22 × 4 × 350

= 61,600 cm²

Q31. Solution:

> **Marking Scheme:** 1 mark for axes + 1 mark for bars + 1 mark for labeling

Histogram:

Draw a histogram with:

• X-axis: Class intervals (0-10, 10-20, 20-30, 30-40)

• Y-axis: Frequency

• Bars with heights: 8, 12, 15, 10 respectively

• No gaps between bars

• Proper labeling and title

[Student should draw the actual histogram on graph paper]

Q32. Solution:

> **Marking Scheme:** 1.5 marks for each angle

In trapezium ABCD with AB || DC:

$\angle A = 70°$ and $\angle B = 80°$ (given)

Property: In a trapezium, angles on the same side are supplementary

Finding $\angle D$:

$\angle A + \angle D = 180°$ (co-interior angles)

$70° + \angle D = 180°$

$\angle D = 110°$

Finding $\angle C$:

$\angle B + \angle C = 180°$ (co-interior angles)

$80° + \angle C = 180°$

$\angle C = 100°$

Answers: $\angle C = 100°$, $\angle D = 110°$

SECTION D - ANSWERS (5 × 3 = 15 Marks)

Q33. Solution:

> **Marking Scheme:** 2.5 marks for each part

(a) Given: $a + b = 10$ and $ab = 24$

We need to find: $a^2 + b^2$

Using identity: $(a + b)^2 = a^2 + 2ab + b^2$

$(10)^2 = a^2 + b^2 + 2(24)$

$100 = a^2 + b^2 + 48$

$a^2 + b^2 = 100 - 48$

$a^2 + b^2 = 52$

(b) Factorize: $25m^2 - 40mn + 16n^2$

$= (5m)^2 - 2(5m)(4n) + (4n)^2$

Using identity: $a^2 - 2ab + b^2 = (a - b)^2$

$= (5m - 4n)^2$

Answer: $(5m - 4n)^2$

OR

$105 \times 95 = (100 + 5)(100 - 5)$

Using identity: $(a + b)(a - b) = a^2 - b^2$

$= 100^2 - 5^2$

$= 10,000 - 25$

$= 9,975$

Q34. Solution:

> **Marking Scheme:** 2 marks for equations + 2 marks for solving + 1 mark for both ages

Let present age of son = x years

Let present age of father = y years

Five years ago:

Father's age = $y - 5$

Son's age = $x - 5$

$y - 5 = 7(x - 5)$

$y - 5 = 7x - 35$

$y = 7x - 30$ ... (1)

Five years hence:

Father's age = $y + 5$

Son's age = $x + 5$

$y + 5 = 3(x + 5)$

$y + 5 = 3x + 15$

$y = 3x + 10$ ... (2)

From (1) and (2):

$7x - 30 = 3x + 10$

$4x = 40$

$x = 10$

$y = 3(10) + 10 = 40$

Present age of son = 10 years

Present age of father = 40 years

Q35. Solution:

> **Marking Scheme:** 2 marks for amount + 2 marks for C.I. + 1 mark for final answer

P = ₹15,625, R = 4%, T = 3 years

$A = P(1 + R/100)^T$

$= 15625(1 + 4/100)^3$

$= 15625(1.04)^3$

$= 15625 \times 1.124864$

= ₹17,576

C.I. = A - P

= 17576 - 15625

C.I. = ₹1,951

OR

P = ₹8,000, R = 5% p.a. = 2.5% half-yearly

Time = 2 years = 4 half-years

$A = P(1 + R/100)^n$

$= 8000(1 + 2.5/100)^4$

$= 8000(1.025)^4$

$= 8000 \times 1.10381289$

= ₹8,830.50

Amount = ₹8,830.50

SECTION E - ANSWERS (4 × 3 = 12 Marks)

Q36. Solution: CASE STUDY 1 - Painting a Room

> **Marking Scheme:** 1 + 1 + 2 = 4 marks

(i) Area of four walls = 2h(l + b)

$= 2 \times 3 \times (8 + 6)$

$= 6 \times 14$

$= 84\ m^2$

(ii) Area of ceiling = $l \times b = 8 \times 6 = 48\ m^2$

Area of 2 windows = $2 \times (2 \times 1.5) = 6\ m^2$

Area of door = $2.5 \times 1.2 = 3\ m^2$

Total area to be painted = 84 + 48 - 6 - 3

$= 123\ m^2$

OR

Total cost = Area × Rate

$= 123 \times 50$

= ₹6,150

(iii) Cost for two coats = 2 × 6,150

= ₹12,300

Q37. Solution: CASE STUDY 2 - Investment Options

> **Marking Scheme:** 1 + 1 + 2 = 4 marks

(i) Bank A (Simple Interest):

S.I. = (P × R × T)/100

= (50000 × 8 × 3)/100

= ₹12,000

(ii) Bank B (Compound Interest):

$A = P(1 + R/100)^T$

$= 50000(1 + 6/100)^3$

$= 50000(1.06)^3$

= 50000 × 1.191016

= ₹59,550.80

OR

C.I. = A - P

= 59550.80 - 50000

= ₹9,550.80

(iii) Bank A gives: ₹12,000

Bank B gives: ₹9,550.80

Bank A gives better returns by:

12,000 - 9,550.80 = ₹2,449.20

Q38. Solution: CASE STUDY 3 - Sports Survey

> **Marking Scheme:** 1 + 1 + 2 = 4 marks

(i) From the table:

Cricket: 32 students (highest)

Football: 24 students

Basketball: 16 students

Tennis: 8 students

Cricket is most popular

(ii) Central angle for Football:

Total students = 80

Football students = 24

Central angle = (24/80) × 360°

= (3/10) × 360°

= 108°

OR

Basketball or Tennis = 16 + 8

= 24 students

(iii) Probability of preferring Cricket:

Total students = 80

Cricket students = 32

P(Cricket) = 32/80

= 2/5

✅ END OF ANSWER KEY ✅

All solutions strictly follow Class 8 NCERT syllabus

Complete step-by-step solutions with marking schemes