

Pooja Model School
MID - TERM WORKSHEET (2026-27)
SUBJECT - MATHEMATICS I CLASS - VIII

Time: 3 Hours	Maximum Marks: 80
Name: _____	Roll No.: _____

General Instructions

1. All questions are compulsory.
2. Section A contains 20 questions of 1 mark each.
3. Section B contains 5 questions of 2 marks each.
4. Section C contains 6 questions of 3 marks each.
5. Section D contains 4 questions of 5 marks each.
6. Section E contains 3 case-based questions of 4 marks each.
7. Internal choice is provided in Sections B, C, D and E.
8. Show necessary working wherever required. 9. Calculators are not permitted.

SECTION A – MCQs & ASSERTION–REASON

20 × 1 = 20 Marks

- Q1. A number is both a perfect square and a perfect cube. Which of the following can be the number?
(A) 72 (B) 144 (C) 216 (D) 288
- Q2. If $2^x \times 2^3 = 2^{11}$, then x is: (A) 6 (B) 7 (C) 8 (D) 9
- Q3. Which number has exactly three distinct prime factors? (A) 30 (B) 36 (C) 42 (D) 49
- Q4. A quadrilateral has angles 75° , 85° , 110° and x° . The value of x is: (A) 80° (B) 90° (C) 100° (D) 110°
- Q5. Which number leaves remainder 3 when divided by both 5 and 7? (A) 18 (B) 23 (C) 38 (D) 43
- Q6. $3^4 \times 3^{-2}$ written as a single power of 3 has exponent: (A) 2 (B) 6 (C) 8 (D) -2
- Q7. A square number has exactly 9 positive factors. Which prime factorisation could represent it?
(A) p^4 (B) p^8 (C) p^6q^2 (D) p^2q^2
- Q8. If 5 notebooks cost ₹175, the cost of 8 notebooks at the same rate is: (A) ₹250 (B) ₹270 (C) ₹280 (D) ₹300
- Q9. In a parallelogram, one angle is 68° . The adjacent angle is: (A) 68° (B) 102° (C) 112° (D) 122°
- Q10. $5^0 + 5^1 + 5^2$ equals: (A) 30 (B) 31 (C) 35 (D) 36
- Q11. A cube has volume 3375 cm^3 . Its edge length is: (A) 12 cm (B) 15 cm (C) 18 cm (D) 25 cm
- Q12. If $a:b = 4:7$ and $b:c = 14:15$, then $a:c$ is: (A) 4:15 (B) 8:15 (C) 8:21 (D) 14:15
- Q13. Which statement is always true for a rectangle? (A) All sides are equal (B) Diagonals are perpendicular (C) Opposite sides are equal (D) All angles are different
- Q14. The smallest number by which 180 must be multiplied to make it a perfect square is: (A) 2 (B) 3 (C) 5 (D) 10
- Q15. If n is odd, which expression is always even? (A) $n+1$ (B) $n+2$ (C) $2n+1$ (D) $3n$

Q16. A map uses the scale 1 cm : 8 km. Two towns are 6.5 cm apart on the map. Their actual distance is: (A) 48 km (B) 50 km (C) 52 km (D) 56 km

Q17. If 12 workers complete a task in 15 days, 20 workers will complete it in: (A) 6 days (B) 8 days (C) 9 days (D) 10 days

Q18. The sum of the first five odd numbers is: (A) 15 (B) 20 (C) 25 (D) 30

Q19. Assertion: Every perfect cube has a prime factorisation in which every exponent is a multiple of 3.

Reason: In a perfect cube, each prime factor occurs in groups of three in its prime factorisation.

(A) Both true and Reason explains Assertion (B) Both true but Reason does not explain (C) Assertion true, Reason false (D) Assertion false, Reason true

Q20. Assertion: If two quantities are directly proportional, their ratio remains constant.

Reason: In direct proportion, when one quantity increases, the other always decreases.

(A) Both true and Reason explains Assertion (B) Both true but Reason does not explain (C) Assertion true, Reason false (D) Assertion false, Reason true

SECTION B – VERY SHORT ANSWER

5 × 2 = 10 Marks

Q21. Find the smallest number by which 294 must be multiplied so that the result is a perfect square.
OR

Find the smallest number by which 675 must be divided so that the quotient is a perfect cube.

Q22. Simplify: $(2^7 \times 3^4) / (2^3 \times 3^2)$.

Q23. The angles of a quadrilateral are in the ratio 2:3:4:6. Find all four angles.

OR

Three angles are 72° , 108° and 95° . Find the fourth angle.

Q24. Find the smallest positive number which leaves remainder 2 when divided by 6, 8 and 12.

Q25. If 15 kg of rice costs ₹720, find the cost of 22.5 kg at the same rate.

SECTION C – SHORT ANSWER

6 × 3 = 18 Marks

Q26. Without actually calculating by long division, determine whether 1764 is a perfect square. If yes, find its square root using prime factorisation.

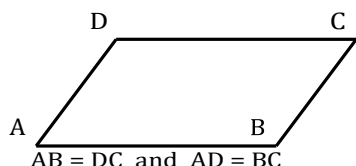
Q27. Simplify and express the answer as a single power: $((5^3)^2 \times 5^4) / 5^5$. Hence find its numerical value.

OR

Simplify: $(2^5 \times 4^3) / 8^2$.

Q28. A number is divisible by both 8 and 15. It lies between 300 and 400. Find all possible numbers and explain your method.

Q29. Study the figure below. In parallelogram ABCD, $\angle A = (3x + 10)^\circ$ and $\angle B = (5x - 30)^\circ$. Find x and all four angles.



OR The diagonals of parallelogram ABCD intersect at O. If $AO = (3x+2)$ cm and $OC = (5x-10)$ cm, find x

and AC.

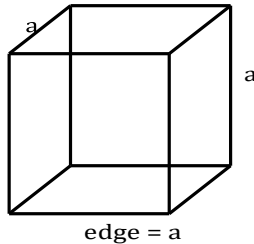
30. A school has 720 students. The ratio of boys to girls is 7:5. Find the number of boys and girls. If 60 new girls join, find the new ratio.

Q31. State whether each pair is directly proportional, inversely proportional, or neither, with a reason: (i) number of workers and time for a fixed job, (ii) number of notebooks and total cost at fixed price, (iii) side of a square and its perimeter.

SECTION D – LONG ANSWER

4 × 5 = 20 Marks

Q32. A solid cube has edge 12 cm. (i) Find its volume. (ii) If the edge is increased by 3 cm, find the new volume. (iii) Find the difference. (iv) Express both volumes in prime-factorised form.



OR Find the cube root of 13824 by prime factorisation and verify the answer by cubing it.

Q33. A number is represented as $N = 2^3 \times 3^2 \times 5 \times 7$. (i) Find the number of factors of N. (ii) Find the smallest factor greater than 20. (iii) Determine whether N is a perfect square or cube, with reason. (iv) Find the smallest number by which N must be multiplied to make it a perfect square.

Q34. In quadrilateral ABCD, $\angle A = (2x+10)^\circ$, $\angle B = (3x-5)^\circ$, $\angle C = (4x-15)^\circ$, $\angle D = (x+10)^\circ$. (i) Find x. (ii) Find all four angles. (iii) State whether the quadrilateral can be a parallelogram and justify.



OR A parallelogram has adjacent angles in the ratio 2:3. Find all four angles. If one diagonal bisects one angle, determine the resulting angle measures.

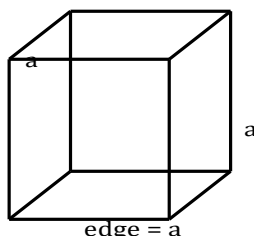
Q35. A factory produces 840 units in 7 days using 12 machines working 8 hours per day. Assuming production is proportional to machines × working hours × days: (i) How many units will 15 machines produce in 6 days at 9 hours/day? (ii) How many machines are required to produce 1800 units in 10 days at 8 hours/day?

SECTION E - CASE-BASED INTEGRATED QUESTIONS

3 × 4 = 12 Marks

Q36. Case Study – Cubical Storage Box: A school designs cubical boxes. The first model has edge 15 cm and the second has edge 20 cm. Answer: (a) volume of first box, (b) volume of second box, (c) factor by which volume increases, (d) whether the new volume is a perfect cube, with reason.

OR Find the cube root of the new volume.



Q37. Case Study – Mathematics Club: There are 96 students. The ratio of boys to girls is 5:3. Students

are to be divided into the greatest possible number of identical groups. Answer: (a) boys and girls, (b) greatest possible number of identical groups, (c) boys and girls per group, (d) if each group gets 4 notebooks, total notebooks required.

OR If the number of groups is doubled, explain whether the identical-group condition remains possible.

Q38. Case Study – Travel and Proportional Reasoning: A bus covers 180 km in 4 hours at constant speed. Answer: (a) distance in 7 hours, (b) time for 315 km, (c) whether distance is directly proportional to time, with reason, (d) if speed increases, whether the same distance takes more or less time, with explanation.

OR Find the time for 270 km at the original speed.

