

Half-Yearly Examination - (2026-27)
SUBJECT – MATHEMATICS (SET – 1)

TIME – 2½ Hours

Class- VIII

M.M – 60

General Instructions: All questions are compulsory. This question paper contains 29 questions divided into Sections A, B, C, and D according to the standard exam blueprint.

SECTION – A (1 x 12 = 12M)

Q1. Which of the following numbers is not a perfect square?

- (A) 121 (B) 144 (C) 150 (D) 169

Q2. The scientific notation of 4,83,000 is:

- (A) 4.83×10^5 (B) 4.83×10^3 (C) 48.3×10^4 (D) 4.83×10^{-5}

Q3. If a population of bacteria triples every 2 hours starting with 4 bacteria, how many bacteria will be present after 6 hours?

- (A) 108 (B) 324 (C) 96 (D) 216

Q4. Which of the following number systems uses base-10 with place-value symbols?

- (A) Roman numeral system (B) Hindu-Arabic numeral system (C) Egyptian system (D) Mayan system

Q5. If the mass of an electron is approximately 9×10^{-31} kg, what is the mass of 10^{15} such electrons?

- (A) 9×10^{-16} kg (B) 9×10^{-46} kg (C) 90×10^{-31} kg (D) 9×10^{-15} kg

Q6. When two parallel lines are intersected by a transversal, the alternate interior angles are always:

- (A) Supplementary (B) Equal (C) Complementary (D) Unequal

Q7. What is the LCM of 15, 20, and 30?

- (A) 30 (B) 60 (C) 90 (D) 120

Q8. Which algebraic property is shown by: $7 \times (x + y) = 7x + 7y$?

- (A) Commutative Property (B) Associative Property (C) Distributive Property (D) Closure Property

Q9. If $a = 3$, $b = -2$, and $c = 4$, find the value of $a^2 + b^2 - c^2$:

- (A) 9 (B) -3 (C) 5 (D) -7

Q10. A number is divisible by 9 if:

- (A) The last digit is 9 (B) The sum of its digits is divisible by 9 (C) It is an odd number (D) The last two digits are divisible by 9

Q11. Assertion (A): The cube of an odd number is always an odd number.

Reason (R): Multiplying odd integers together always yields an odd product.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) Assertion A is true but Reason R is false.
- (D) Assertion A is false but Reason R is true.

Q12. Assertion (A): The sum of interior angles of a quadrilateral is 360° .

Reason (R): A quadrilateral can be divided into two triangles by drawing a diagonal.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) Assertion A is true but Reason R is false.
- (D) Assertion A is false but Reason R is true.

SECTION – B (2 x 7 = 14M)

Q13. Find the side length of a square field whose area is 1024 m^2 .

Q14. Evaluate and write in standard form: (i) 6.4×10^{-3} (ii) 3.25×10^5

Q15. Convert the decimal number 92 into binary number system representation.

Q16. Write the Roman numeral representation for 1985.

Q17. The measures of three angles of a quadrilateral are 80° , 95° , and 110° . Find the measure of the fourth angle.

Q18. Check whether the number 5,28,432 is divisible by 11 without actual long division.

Q19. Expand the algebraic product: $(4x - 5)(2x + 3)$

SECTION – C (3 x 6 = 18M)

Q20. Using suitable properties, evaluate: $842 \times 97 + 842 \times 3$.

Q21. [Case Study / Algebra] In a school plantation drive, Class 8A plants $x^2 + 5x - 3$ trees, Class 8B plants $2x^2 - 3x + 7$ trees, and total trees planted by both classes combined is expressed as $4x^2 + x + 10$. Find the expression for trees planted by Class 8C.

Q22. [Figure Geometry Case] Construct a rhombus with diagonals 5 cm and 7 cm. Write the step-by-step construction procedure.

Q23. Simplify using laws of exponents and write with positive exponents: $(3^{-2} \times 5^{-3}) / 15^{-4}$.

Q24. A student has 5 science books, 4 story books, and 3 notebooks. In how many ways can the student choose one book of each type?

Q25. Find the smallest number by which 1372 must be divided so that the quotient is a perfect cube. Also find the cube root of the quotient.

SECTION - D (4 x 4 = 16M)

Q26. [Case Study / Growth Problem] A research lab starts with 500 virus cells. The population increases fourfold every hour.

- (i) How many cells will there be after 3 hours?
- (ii) On which hour will the population exceed 1,00,000?
- (iii) If the growth rate doubles every 30 minutes instead, find the count after 1.5 hours.

Q27. Use laws of exponents to evaluate: $[(2^3)^2 \times 3^4] / (12^3)$.

Q28. Compute using suitable algebraic identities:

- (i) $(102)^2$ using $(a + b)^2$
- (ii) 97×103 using $(a + b)(a - b)$

Q29. [Figure Construction / Quadrilateral] Construct a parallelogram PQRS where PQ = 6 cm, QR = 4.5 cm, and diagonal PR = 7 cm. Write the construction steps.