

HALF YEARLY EXAMINATION: 2025-2026

CLASS: IX

SUBJECT: MATHEMATICS

NAME OF THE STUDENT: _____

MAX. MARKS: 80

DATE: _____

TIME: 3 HOURS

NOTE: You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers.

Section A is compulsory. Attempt any four questions from Section B. The intended marks for the questions or parts of the questions are given in the bracket [].

Section A

(Attempt all questions from this Section)

Question 1

Choose the correct answers to the questions from the given options.

[15]

(Do not copy the question, write the correct answers only.)

(i) Which of the following numbers has terminating decimal representation?

- (a) $\frac{3}{7}$ (b) $\frac{3}{5}$ (c) $\frac{1}{3}$ (d) $\frac{3}{11}$

(ii) The compound interest on ₹ 1000 at 10% p.a. compounded annually for 2 years is:

- (a) ₹ 190 (b) ₹ 200 (c) ₹ 210 (d) ₹ 1210

(iii) $(102)^2 - (98)^2$ is equal to

- (a) 200 (b) 400 (c) 600 (d) 800

(iv) Factorisation of $12a^2b + 15ab^2$ is:

- (a) $3a(4ab + 5b^2)$ (b) $3b(4a^2 + 5ab)$ (c) $3ab(4a + 5b)$ (d) none of these

(v) The value of $(5\frac{1}{16})^{-\frac{3}{4}}$ is:

- (a) $\frac{4}{9}$ (b) $\frac{9}{4}$ (c) $\frac{27}{8}$ (d) $\frac{8}{27}$

(vi) If $\log_{0.5} 64 = x$, then the value of x is:

- (a) -4 (b) -6 (c) 4 (d) 6

(vii) Which of the following is not a criterion for congruency of triangles?

- (a) SAS (b) ASA (c) SSA (d) SSS

(viii) The class mark of the class 90-120 is:

- (a) 90 (b) 105 (c) 115 (d) 120

(ix) If P is a point in the interior of a circle with centre O and radius r , then

- (a) $OP = r$ (b) $OP > r$ (c) $OP \geq r$ (d) $OP < r$

(x) In $\triangle ABC$, $AB = AC$ and $\angle B = 50^\circ$. Then $\angle C$ is equal to:

- (a) 40° (b) 50° (c) 80° (d) 130°

(xi) Assertion (A): $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$

Reason (R): $\sin^2 \theta + \cos^2 \theta = 1$

(a) Assertion (A) is true, Reason (R) is false. (b) Assertion (A) is false, Reason (R) is true.

(c) Both Assertion (A) and Reason (R) are true. (d) Both Assertion (A) and Reason (R) are false.

(xii) If $\cos A = \frac{4}{5}$, then the value of $\tan A$ is:

- (a) $\frac{3}{5}$ (b) $\frac{3}{4}$ (c) $\frac{4}{3}$ (d) $\frac{5}{3}$

(xiii) In $\triangle ABC$, $AB = 3\text{cm}$, $BC = 4\text{cm}$ and $CA = 5\text{cm}$. If D and E are mid points of AB and BC respectively, then the length of DE is:

- (a) 1.5cm (b) 2cm (c) 2.5cm (d) 3.5cm

(xiv) The value of $\sin 45^\circ + \cos 45^\circ$ is:

- (a) $1/\sqrt{2}$ (b) $\sqrt{2}$ (c) $\sqrt{3}/2$ (d) 1

(xv) If the lengths of two sides of an isosceles triangle are 4 cm and 10 cm, then the length of the third side is:

- (a) 4cm (b) 10cm (c) 7cm (d) 14cm

Question 2

(a) Factorise: $3 - 12(a - b)^2$. [4]

(b) Simplify: $\frac{a^{-1}+b^{-1}}{(ab)^{-1}}$. [4]

(c) If $a = 2 + \sqrt{3}$, then find the value of $a - \frac{1}{a}$. [4]

Question 3

(a) Solve for x: $\log(3x - 2) = 2$ [4]

(b) If $x + \frac{1}{x} = 6$, find (i) $x - \frac{1}{x}$ (ii) $x^2 - \frac{1}{x^2}$. [4]

(c) The compound interest on a certain sum of money at 5% per annum for two years is ₹ 246. Calculate the simple interest on the same sum for three years at 6% per annum. [5]

Section B

(Attempt any four questions from this Section)

Question 4

(a) Find two irrational numbers between $\sqrt{2}$ and $\sqrt{7}$. [3]

(b) Given that $\tan \theta = \frac{5}{12}$ and θ is an acute angle, find $\sin \theta$ and $\cos \theta$. [3]

(c) Sides of a triangle are in the ratio 12:17:25 and its perimeter is 540 cm. Find its area. [4]

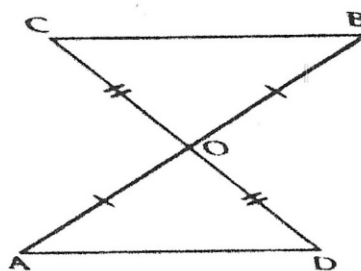
Question 5

(a) Simplify: $\sqrt[3]{27^{-2}}$ [3]

(b) The radius of a circle is 10 cm. Find the length of the chord which is at a distance of 6 cm from the centre of the circle. [3]

(c) In the adjoining figure, $OA = OB$ and $OD = OC$. Show that:

(i) $\triangle AOD \cong \triangle BOC$ (ii) $AD \parallel CB$. [4]



Question 6

(a) Evaluate: $\log_4 8 - \log_8 32$. [3]

(b) If the length of a diagonal of a square is $6\sqrt{2}$ cm, find its (i) perimeter and (ii) area. [3]

(c) The distribution of weights (in kg) of 40 students in a class is as given below.

Weight (in kg)	36-40	41-45	46-50	51-55	56-60	61-65	Total
Number of students	3	6	5	10	9	7	40

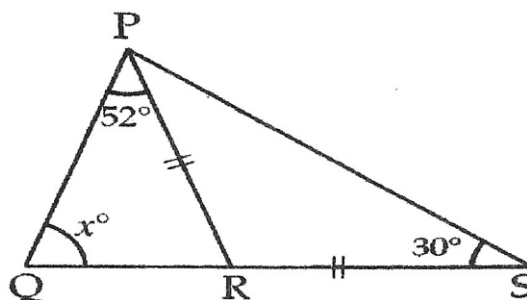
(i) Draw a histogram for the distribution.

(ii) Draw a frequency polygon for the distribution. [4]

Question 7

(a) In the following figure, find the value of x :

[3]



(b) If $0^\circ < \theta < 90^\circ$, then find θ satisfying the following: $\sqrt{2} \sin 3\theta = 1$.

[3]

(c) The present population of a town is 48,000. It is increasing at the rate of 5% every year.

What will be the increase in population in next 3 years.

[4]

Question 8

(a) Find the median of the following data: 15, 13, 15, 14, 16, 13, 13, 14, 12, 15, 10.

[3]

(b) Evaluate without using table: $\frac{\sin 80^\circ}{\cos 10^\circ} + \sin 59^\circ \sec 31^\circ$.

[3]

(c) If $a + b + 2c = 0$, prove that $a^3 + b^3 + 8c^3 = 6abc$.

[4]

Question 9

(a) Find the area and perimeter of a semicircle of radius 7 cm. (Use $\pi = \frac{22}{7}$).

[3]

(b) Find the value of k in the following: $2^4 \times (0.5)^{-3} = 2^k$.

[3]

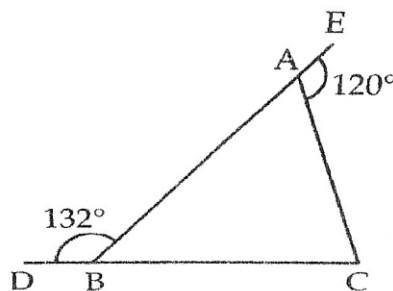
(c) If $a + \frac{1}{a} = 2$, find $a^3 + \frac{1}{a^3}$.

[4]

Question 10

(a) In the adjoining figure, $\angle ABD = 132^\circ$ and $\angle EAC = 120^\circ$. Prove that: $AB > AC$.

[3]

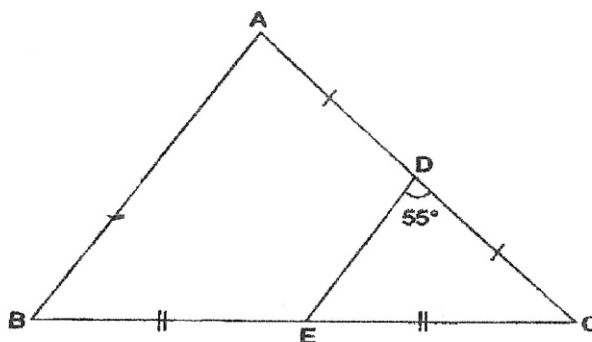


(b) If $x + y + z = 12$ and $x^2 + y^2 + z^2 = 44$, find $xy + yz + zx$.

[3]

(c) In the adjoining figure, find (a) $\angle BAC$, (b) AB if $DE = 2.1$ cm.

[4]



END

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