

Class 10 Mathematics (Standard) Practice Paper**Based on the Latest CBSE Exam Pattern****Time Allowed: 3 Hours****Maximum Marks: 80**

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D, and E.
 2. **Section A** has 20 Multiple Choice Questions (MCQs) carrying 1 mark each. (*10 representative questions provided in this mock test*)
 3. **Section B** has 4 Short Answer-I (SA-I) type questions carrying 2 marks each.
 4. **Section C** has 4 Short Answer-II (SA-II) type questions carrying 3 marks each.
 5. **Section D** has 3 Long Answer (LA) type questions carrying 5 marks each.
 6. **Section E** has 2 Case Based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
 7. All Questions are compulsory. However, an internal choice has been provided in some questions.
 8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.
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SECTION A*(Multiple Choice Questions - 1 Mark Each)*

1. The HCF of 96 and 404 is:
(a) 120
(b) 4
(c) 10
(d) 3
2. If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then:
(a) $a = -7, b = -1$
(b) $a = 5, b = -1$
(c) $a = 2, b = -6$
(d) $a = 0, b = -6$
3. The distance of the point $P(2, 3)$ from the x-axis is:
(a) 2 units

- (b) 3 units
(c) 1 unit
(d) 5 units
4. If $\sin A = \frac{1}{2}$, then the value of $\cot A$ is:
(a) $\sqrt{3}$
(b) $\frac{1}{\sqrt{3}}$
(c) $\frac{\sqrt{3}}{2}$
(d) 1
5. The midpoint of the line segment joining the points $A(-2, 8)$ and $B(-6, -4)$ is:
(a) $(-4, -6)$
(b) $(2, 6)$
(c) $(-4, 2)$
(d) $(4, 2)$
6. In $\triangle ABC$, right-angled at B, $AB = 24$ cm, $BC = 7$ cm. The value of $\sin A$ is:
(a) $\frac{24}{25}$
(b) $\frac{7}{25}$
(c) $\frac{7}{24}$
(d) $\frac{25}{7}$
7. The empirical relationship between the three measures of central tendency is:
(a) $3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$
(b) $2 \text{ Median} = \text{Mode} + 3 \text{ Mean}$
(c) $\text{Median} = 3 \text{ Mode} - 2 \text{ Mean}$
(d) $\text{Mean} = \text{Mode} + \text{Median}$
8. If the perimeter and the area of a circle are numerically equal, then the radius of the circle is:
(a) 2 units
(b) π units
(c) 4 units
(d) 7 units
9. The pair of linear equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has:
(a) A unique solution

- (b) Exactly two solutions
- (c) Infinitely many solutions
- (d) No solution

10. The probability of an impossible event is:

- (a) 1
- (b) 0
- (c) $\frac{1}{2}$
- (d) Not defined

SECTION B

(Short Answer Type I Questions - 2 Marks Each)

11. Prove that $5 - \sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.
12. Find the coordinates of the point which divides the line segment joining the points $(-1, 7)$ and $(4, -3)$ in the ratio $2 : 3$.
13. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.
14. Evaluate the following:

$$\frac{2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ}{\sec 30^\circ + \operatorname{cosec} 30^\circ}$$

SECTION C

(Short Answer Type II Questions - 3 Marks Each)

15. Prove that the lengths of tangents drawn from an external point to a circle are equal.
16. Find the roots of the quadratic equation $2x^2 - 7x + 3 = 0$ by the method of factorization.
17. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.
18. Prove the following trigonometric identity:

$$\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$$

SECTION D*(Long Answer Type Questions - 5 Marks Each)*

19. A motorboat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.
20. State and prove the Basic Proportionality Theorem (Thales Theorem).
21. The angles of depression of the top and the bottom of an 8 m tall building from the top of a multi-storeyed building are 30° and 45° , respectively. Find the height of the multi-storeyed building and the distance between the two buildings.

SECTION E*(Case Study Based Questions - 4 Marks Each)***22. Case Study 1: Arithmetic Progression in Real Life**

Your elder brother wants to buy a car and plans to take a loan from a bank for his car. He repays his total loan of Rs. 1,18,000 by paying every month starting with the first installment of Rs. 1000. If he increases the installment by Rs. 100 every month, answer the following:

- (i) What is the amount paid by him in the 30th installment? *(1 Mark)*
- (ii) What is the total amount paid by him in the first 30 installments? *(1 Mark)*
- (iii) What ratio of the total loan does he still have to pay after the 30th installment? *(2 Marks)*

23. Case Study 2: Coordinate Geometry

In a classroom, 4 friends are seated at the points A, B, C, and D. Champa and Chameli walk into the class and after observing for a few minutes, Champa asks Chameli, "Don't you think ABCD is a square?" Chameli disagrees. The coordinates of the students are $A(3, 4)$, $B(6, 7)$, $C(9, 4)$, and $D(6, 1)$.

- (i) Find the distance between A and B. *(1 Mark)*
- (ii) Find the distance between the diagonals AC and BD. *(1 Mark)*
- (iii) Using the distance formula, determine whether ABCD forms a square or not to resolve the disagreement between Champa and Chameli. Justify your answer. *(2 Marks)*

Need Help Solving These Questions?

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