

Class 10 Mathematics Practice Sample Paper

Based on the Latest 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.
3. **Section B** has 5 questions carrying 02 marks each.
4. **Section C** has 6 questions carrying 03 marks each.
5. **Section D** has 4 questions carrying 05 marks each.
6. **Section E** has 3 case based integrated units of assessment (04 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 in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2-marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION A

(Questions 1 to 20 carry 1 mark each)

1. The HCF and LCM of 12, 21, 15 respectively are:
(a) 3, 140
(b) 12, 420
(c) 3, 420
(d) 420, 3
2. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is:
(a) 10
(b) -10
(c) 5
(d) -5
3. The distance of the point P(2, 3) from the x-axis is:
(a) 2
(b) 3
(c) 1
(d) 5
4. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is:

- (a) $5/4$ (b) $2/5$ (c) $15/4$ (d) $3/2$
5. The roots of the quadratic equation $x^2 - 0.04 = 0$ are:
- (a) ± 0.2 (b) ± 0.02 (c) 0.4 (d) 2
6. In an AP, if $d = -4$, $n = 7$, $a_n = 4$, then a is:
- (a) 6 (b) 7 (c) 20 (d) 28
7. The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is:
- (a) 0 (b) 1 (c) 2 (d) $1/2$
8. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is:
- (a) $22:7$ (b) $14:11$ (c) $7:22$ (d) $11:14$
9. A die is thrown once. The probability of getting a prime number is:
- (a) $1/2$ (b) $1/3$ (c) $1/6$ (d) $2/3$
10. The empirical relationship between the three measures of central tendency is:
- (a) $3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$
(b) $3 \text{ Mean} = \text{Mode} + 2 \text{ Median}$
(c) $3 \text{ Mode} = \text{Median} + 2 \text{ Mean}$
(d) $\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$

(Note: Questions 11 to 20 follow a similar objective format in the actual pattern. For this practice paper, we proceed to Assertion-Reasoning).

DIRECTION: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.
11. **Assertion (A):** The HCF of two numbers is 5 and their product is 150, then their LCM is 30.
Reason (R): For any two positive integers a and b , $\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$.
12. **Assertion (A):** The point $(0, 4)$ lies on the y-axis.
Reason (R): The x-coordinate of the point on the y-axis is zero.

SECTION B

(Questions 21 to 25 carry 2 marks each)

21. Find the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$, and hence find the nature of its roots.
22. Evaluate: $\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$
23. 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.
24. Find the 11th term from the last term (towards the first term) of the AP: 10, 7, 4, ..., -62.
25. **OR**
If the sum of first 14 terms of an AP is 1050 and its first term is 10, find the 20th term.
26. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$.

SECTION C

(Questions 26 to 31 carry 3 marks each)

26. Prove that $\sqrt{5}$ is an irrational number.
27. Solve the following pair of linear equations algebraically:

$$3x + 4y = 10$$

$$2x - 2y = 2$$

28. Prove that:

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$$

29. **OR**

Prove that:

$$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$$

30. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.
31. Find the coordinates of the points of trisection of the line segment joining (4, -1) and (-2, -3).
32. Given that $\sqrt{3}$ is irrational, prove that $5 + 2\sqrt{3}$ is irrational.

SECTION D

(Questions 32 to 35 carry 5 marks each)

32. State and prove the Basic Proportionality Theorem (Thales Theorem).

OR

In a right-angled triangle, prove that the square of the hypotenuse is equal to the sum of the squares of the other two sides.

33. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.
34. The median of the following data is 525. Find the values of x and y , if the total frequency is 100.

Class Interval	Frequency
0 - 100	2
100 - 200	5
200 - 300	x
300 - 400	12
400 - 500	17
500 - 600	20
600 - 700	y
700 - 800	9
800 - 900	7
900 - 1000	4

35. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that 1 cm^3 of iron has approximately 8g mass. (Use $\pi = 3.14$)

SECTION E

(Case Study Based Questions - 4 marks each)

36. Case Study 1: GPS and Coordinate Geometry

In a smart city project, the city planners are using a coordinate system to map the locations of various essential services. The origin $(0, 0)$ represents the City Hall. The Police Station is located at $P(4, 5)$, the Fire Station at $F(-3, 4)$, and the Hospital at $H(2, -3)$. All coordinates are in kilometers.

- (i) Find the straight-line distance between the Police Station (P) and the City Hall. (1 Mark)
- (ii) What is the distance between the Fire Station (F) and the Hospital (H)? (1 Mark)

- (iii) The planners want to build a new Emergency Response Center exactly halfway between the Police Station and the Hospital. Find the coordinates of this new center. (2 Marks)

OR

Find the area of the triangle formed by the City Hall, Police Station, and Fire Station. (2 Marks)

37. Case Study 2: Applications of Trigonometry

Rohan is flying a kite in a nearby park. He has let out 100 meters of string, and the string makes an angle of 60° with the horizontal ground. Assume that there is no slack in the string. His friend, Sohan, is standing directly below the kite.

- (i) Draw a neat labelled figure representing the above situation. (1 Mark)
- (ii) Find the height of the kite above the ground. (1 Mark)
- (iii) Find the distance between Rohan and Sohan. (2 Marks)

OR

If Rohan lets out an additional 50 meters of string and the angle of elevation remains the same, what will be the new height of the kite? (2 Marks)

38. Case Study 3: Arithmetic Progressions in Real Life

A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year.

- (i) Find the production in the 1st year. (1 Mark)
- (ii) Find the production in the 10th year. (1 Mark)
- (iii) Find the total production in first 7 years. (2 Marks)

OR

In which year will the production reach 1000 sets? (2 Marks)

Master CBSE Class 10 Mathematics!

Need personalized help with complex theorems, algebra, or trigonometry? Connect with expert tutors on **UrbanPro.com**.

[Click Here to Find Your Perfect Math Tutor on UrbanPro](#)