

Mathematics Practice Question Paper
Class 10 (Based on 2018 Exam Pattern)

Time Allowed: 3 Hours

Maximum Marks: 80

General Instructions:

- (i) All questions are compulsory.
 - (ii) The question paper consists of 30 questions divided into four sections: A, B, C, and D.
 - (iii) **Section A** contains 6 questions of 1 mark each.
 - (iv) **Section B** contains 6 questions of 2 marks each.
 - (v) **Section C** contains 10 questions of 3 marks each.
 - (vi) **Section D** contains 8 questions of 4 marks each.
 - (vii) There is no overall choice. However, an internal choice has been provided in some questions. You have to attempt only one of the alternatives in all such questions.
 - (viii) Use of calculators is not permitted.
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SECTION A

Questions 1 to 6 carry 1 mark each.

- 1. Find the value of k for which the quadratic equation $kx^2 - 6x - 2 = 0$ has real roots.
- 2. Find the 10th term of the Arithmetic Progression (A.P.): 2, 7, 12, ...
- 3. Evaluate: $\sin^2 60^\circ + 2 \tan 45^\circ - \cos^2 30^\circ$.
- 4. Find the distance of the point $P(2, 3)$ from the x-axis.
- 5. Given $\text{HCF}(252, 594) = 18$, find $\text{LCM}(252, 594)$.
- 6. In $\triangle ABC$, $DE \parallel BC$. Find the value of x if $AD = x$, $DB = x - 2$, $AE = x + 2$, and $EC = x - 1$.

SECTION B

Questions 7 to 12 carry 2 marks each.

7. Prove that $3 + 2\sqrt{5}$ is an irrational number, given that $\sqrt{5}$ is irrational.
8. Find the sum of the first 20 terms of the A.P.: 1, 4, 7, 10, ...
9. Find the coordinates of the point which divides the line segment joining the points $(-1, 7)$ and $(4, -3)$ in the ratio 2 : 3.
10. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is red?
11. A die is thrown once. Find the probability of getting a prime number.
12. Solve the following pair of linear equations for x and y :

$$x + y = 14$$

$$x - y = 4$$

SECTION C

Questions 13 to 22 carry 3 marks each.

13. Prove that $\sqrt{2}$ is an irrational number.
14. Find all the zeroes of the polynomial $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if it is known that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.
15. Solve the following pair of linear equations graphically:

$$x + 3y = 6$$

$$2x - 3y = 12$$

16. How many terms of the A.P. 9, 17, 25, ... must be taken to give a sum of 636?
17. Prove that the lengths of tangents drawn from an external point to a circle are equal.
18. Draw a triangle ABC with sides $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC .
19. Prove the following trigonometric identity:

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

20. The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has its circumference equal to the sum of the circumferences of the two circles.

21. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder.
22. Find the mean of the following frequency distribution:

Class Interval	Frequency
0 - 10	5
10 - 20	8
20 - 30	20
30 - 40	15
40 - 50	7
50 - 60	5

SECTION D

Questions 23 to 30 carry 4 marks each.

23. A motor boat 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.
24. State and prove the Pythagoras Theorem.
25. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower.
26. A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform.
27. 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

28. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

29. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length. Also, verify the measurement by actual calculation.
30. 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.

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