

PRE-BOARD EXAMINATION – 1 (DECEMBER – 2019)

CLASS: X

MATHEMATICS (BASIC)

Time: 3hrs.

MAX. MARKS: 80

General Instructions:

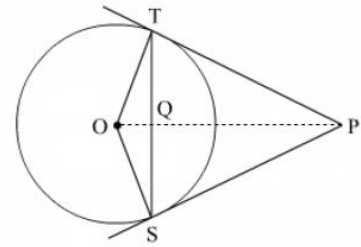
- (I) All questions are compulsory
- (II) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
- (IV) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks and three questions of 4 marks each. You have to attempt only one of the alternatives in all such cases.
- (V) Use of calculators is not permitted.

SECTION-A

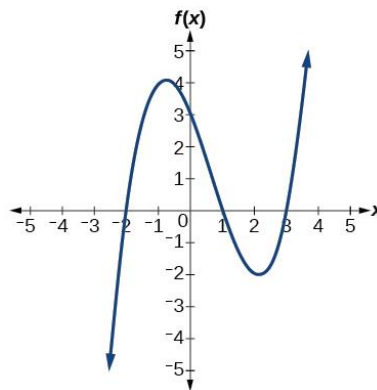
Q 1- 10 are multiple choice questions. Select the most appropriate answer from the given options.

1. HCF of 95 and 152 is 1
 (a) 57 (b) 1 (c) 38 (d) 19
2. One card is drawn from a well shuffled deck of 52 cards. The probability that it is black queen is 1
 (a) $\frac{3}{26}$ (b) $\frac{2}{13}$ (c) $\frac{1}{13}$ (d) $\frac{1}{26}$
3. Empirical relationship between the three measures of central tendency is 1
 (a) $2 \text{ Mean} = 3 \text{ Median} - \text{Mode}$ (b) $2 \text{ Mode} = 3 \text{ Median} - \text{Mean}$
 (c) $\text{Mode} = 2 \text{ Mean} - 3 \text{ Median}$ (d) $3 \text{ Median} = \text{mode} + 2 \text{ mean}$
4. The product of the zeroes of the of the polynomial $x^2 - 5x + 21$ is 1
 (a) 21 (b) -5 (c) -21 (d) 4
5. The distance of the point P (3, - 4) from the origin is 1
 (a) 7 units (b) 5 units (c) 4 units (d) 3 units
6. The midpoint of the line segment joining the points (5, 7) and (1, 3) is 1
 (a) (-3, 7) (b) (3, 5) (c) (-1, 5) (d) (5, -3)

7. In the figure, $PT = 10$ cm. The length of PS is
 (a) 5cm (b) 20cm (c) 10cm (d) 25cm



8. The prime factorisation of 250 is
 (a) $5^3 \times 2$ (b) $2^3 \times 5$ (c) $3^5 \times 2$ (d) $3^3 \times 5$
9. The HCF of the smallest composite number and the smallest prime number is
 (a) 1 (b) 2 (c) 4 (d) 3
10. The graph of $y = p(x)$, where $p(x)$ is a polynomial in one variable, is as follows.



The number of zeroes of $p(x)$ is

- a)1 (b) 2 (c) 4 (d) 3

Questions 11-15 fill in the blanks:

11. The distance of the point $(4,-3)$ from the origin is 1
12. The pair of lines represented by the equations $2x+y+3 = 0$ and $4x+ky+6 = 0$ will be parallel if value of k is 1

OR

If the quadratic equation $x^2 - 2x + k = 0$ has equal roots, then value of k is.....

13. The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is..... 1
14. The value of $\sin 39^\circ - \cos 51^\circ$ is 1
15. In a triangle ABC , D and E are points on the sides AB and AC respectively such that $DE \parallel BC$. If $AD = 6$ cm, $DB = 9$ cm and $AE = 8$ cm, find EC . 1

Questions (16 – 20) Answer the following :

16. In $\triangle PQR$, right angled at Q, $PQ = 4\text{cm}$ and $RQ = 3\text{cm}$. Find the value of $\sin P$. 1

OR

If $15 \cot A = 8$, then find value of $\operatorname{cosec} A$.

17. Find the area of a circle whose circumference is 22cm . 1
18. A dice is thrown once. Find the probability of getting a prime number. 1
19. If $\triangle ABC \sim \triangle DEF$ such that $BC = 3\text{cm}$, $EF = 4\text{cm}$ and $\text{ar}(\triangle ABC) = 54\text{cm}^2$. Determine the area of $\triangle DEF$. 1
20. The first term of an AP is P and the common difference is q. Find its 10th term. 1

SECTION-B

21. One card is drawn from a pack of 52 cards, each of the 52 cards being equally likely to be drawn. Find the probability that the card drawn is 2
- (i) a face card
- (ii) an ace
22. A bag contains tickets numbered 11, 12, 13, ..., 30. A ticket is taken out from the bag at random. Find the probability that the number on the drawn ticket is a multiple of 7. 2

OR

Two dice are thrown simultaneously at random. Find the probability of getting a sum of eight.

23. Prove that 'The lengths of the tangents drawn from an external point to a circle are equal'. 2
24. Prove that $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ = 1$ 2

OR

If $\sin 3A = \cos(A - 26^\circ)$, where $3A$ is an acute angle, find the value of A .

25. Find the area of a sector of a circle of radius 28cm and center angle 45° . 2
26. Find a quadratic polynomial whose zeroes are 5 and -2. 2

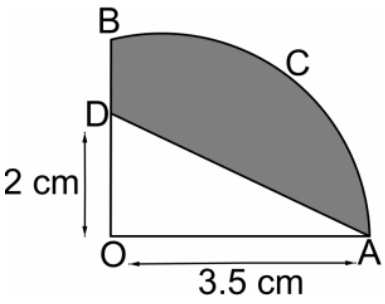
SECTION C

27. Find the zeroes of the quadratic polynomial $x^2 - 3x - 10$ and verify the relationship between the zeroes and coefficient. 3
28. Draw a circle of radius 5 cm. From the point 7 cm away from its centre, construct the pair of tangents to the circle. 3

29. The diameter of a roller is 35 cm and is 130 cm long. If it completes 200 revolutions to level a playground. Determine the cost of leveling at the rate of 3 rupees per m². 3

OR

In the given figure, AOBCA represents a quadrant of a circle of radius 3.5 cm with centre O. Calculate the area of the shaded portion (Take $\pi = \frac{22}{7}$)



30. Prove that $\operatorname{cosec}^2 \theta + \sec^2 \theta = \operatorname{cosec}^2 \theta \sec^2 \theta$ 3

OR

Prove that $\sqrt{\frac{1-\cos \theta}{1+\cos \theta}} = \operatorname{cosec} \theta \cot \theta$

31. Prove that $2 - \sqrt{3}$ is irrational, given that $\sqrt{3}$ is irrational. 3

OR

There is a circular path around a sports field. Priya takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and in the same direction. After how many minutes will they meet again at the starting point?

32. Prove that 'The parallelogram circumscribing a circle is a rhombus'. 3
33. In a flower bed there are 23 rose plants in the first row, 21 in the second row, and 19 in the third row and so on. There are 5 plants in the last row. How many rows are there in the flower bed? 3
34. For what value of k, the following system of equations have infinite number of solutions. 3
- $$4x + 5y = 3$$
- $$kx + 15y = 9$$

SECTION-D

35. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, find the numbers. 4
36. If the sum of first 14 terms of an A.P. is 1050 and its first term is 10, find the 20th term. 4

OR

The first term of an A.P. is 5, the last term is 45 and sum is 400. Find the number of terms and the common difference

37. The angle of elevation of the top of the building from the foot of the tower is 30° and the angle of the top of the tower from the foot of the building is 60° . If the tower is 50 m high, find the height of the building. 4

38. State and prove the Pythagoras theorem. 4

OR

If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.

39. A cone of height 24cm and radius of base 6cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the radius of the sphere. 4

OR

A vessel is in the form of an inverted cone. Its height is 8cm and the radius of its top, which is open, is 5cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

40. The following distribution gives the daily income of 50 workers of a factory. 4

Daily income (in Rs.)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution and draw its ogive.