CBSE Board

Class X Mathematics

Sample Paper 9 (Standard)

Time: 3 hrs **Total Marks: 80**

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1. **All** questions are **compulsory**.
2. The question paper consists of **40** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **20** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **8** questions of 3 marks each and **Section D** comprises of **6** questions of 4 marks each.
3. 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** each, and **three questions of 4 marks** each. You have to attempt only one of the alternatives in all such questions.
4. Use of calculator is **not** permitted.

Section A

(Questions 1 to 10 are multiple choice questions. Select the most appropriate answer from the given options)

1. If the HCF of 65 and 117 is of the form 65m – 117 then m = ?

A. 1
B. 2
C. 3
D. 4

2. The cumulative frequency table is useful in determining the

A. Mean
B. Median
C. Mode
D. None of these

3. The product of two numbers is 1600 and their HCF is 5. The LCM of the numbers is

A. 320
B. 1600
C. 1605
D. 8000

4. The graphs of the equations $6x - 2y + 9 = 0$ and $3x - y + 12 = 0$ are two lines which are

A. Coincident
B. Parallel
C. Intersecting exactly at one point
D. Perpendicular to each other

5. $\sin 40° - \cos 50° =$

A. $\sin 10°$
B. $\cos 10°$
C. 1
D. 0

6. $\frac{\tan 30°}{\cot 60°} =$

A. $\frac{1}{\sqrt{2}}$
B. $\frac{1}{\sqrt{3}}$
C. $\sqrt{3}$
D. 1

7. If A and B are acute angles such that $\sin A = \cos B$, then $A + B = ?$

A. 45°
B. 60°
C. 90°
D. 180°

8. The distance of a point P(3, 4) from the x-axis is?

A. 3 units
B. 4 units
C. 7 units
D. 1 units

9. If P(-1, 1) is the midpoint of the line segment joining the points A(-3, b) and B(1, b + 4) then b =

A. -1
B. 0
C. 1
D. 2

10. If the points A(2, 3), B(5, k) and C(6, 7) are collinear then k =

A. -3/2

B. 4

C. 6

D. 11/4

(Q 11 to Q 15) Fill in the blanks

11. Each side of an equilateral triangle measures 8 cm. Its area is ___

12. The sum and product of the zeroes of a quadratic polynomial are 3 and -10 respectively. The quadratic polynomial is ___

OR

If two of the zeros of the cubic polynomial $ax^3 + bx^2 + cx + d$ are 0, then the third zero is ___

13. $\Delta ABC \sim \Delta PQR$. If $ar(\Delta ABC) = 4\ ar(\Delta PQR)$ and BC = 12 cm, then QR = ___

14. The sum of first 16 terms of the AP 5, 8, 11, 14,…. is ____

15. The probability of an impossible event is ____

(Q 16 to Q 20) Answer the following

16. Examine whether $\frac{17}{30}$ is a terminating decimal?

17. If $\triangle ABC \sim \triangle RQP$, $\angle A = 80°$, $\angle B = 60°$, the value of $\angle P$ is?

18. Two circles touch each other externally at C and AB is a common tangent to the circles. Then, $\angle ACB$ = ?

OR

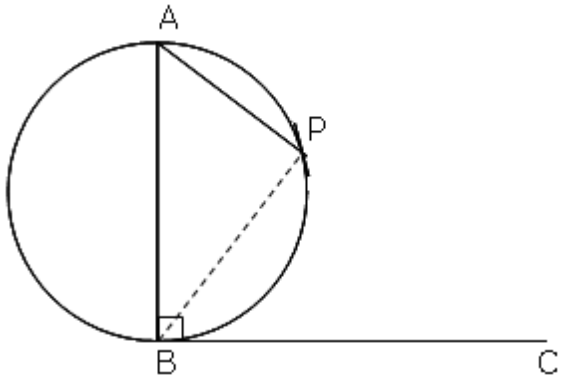
If the angle between two radii of a circle at the centre is 100^o. What is the angle between the tangents made at the ends of radii?

19. The first and last terms of an AP are 1 and 11. If the sum of all its terms is 36, then find the number of terms.

20. For what value(s) of k will the equation $kx^2 - 5x + k = 0$ have a repeated root?

Section B

21. AB is a diameter of a circle. BC is the tangent to the circle at B as shown in the given figure. Show that $\angle PBC = \angle BAP$.



22. Without actually performing division, state whether the number $\frac{29}{343}$ will have a terminating decimal representation or not.

23. How many solid spheres of diameter 6 cm are required to be melted to form a solid metal cylinder of height 45 cm and diameter 4 cm?

OR

Three cubes whose edge measures 3 cm, 4 cm and 5 cm respectively forms a single cube. Find its edge.

24. Find the mean of the following data:

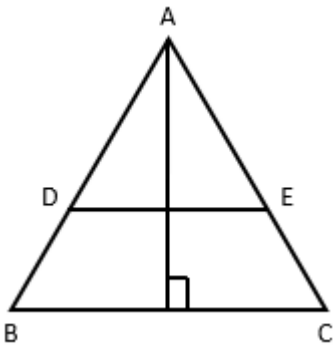
Classes	Frequency
0-10	7
10-20	3
20-30	15
30-40	5

OR

A die is thrown at once. What is the probability of getting a prime number?

25. The height of a tower is $100\sqrt{3}$ m. The angle of elevation of its top from a point 100 m away from its foot is?

26. In the given figure, DE || BC such that AD = x cm, DB = (3x + 4) cm, AE = (x + 3) cm, and EC = (3x + 19) cm. Find the value of x.



Section C

27. Show that $6 + \sqrt{2}$ is irrational.

28. Find three terms of an A.P. whose sum is 3 and product is −8.

29. A leading library has a fixed charge for the first three days and an additional charge for each day thereafter. Bhavya paid Rs. 27 for a book kept for seven days, while Vrinda paid Rs. 21 for a book kept for five days. Find the fixed charge and charge for each extra day.

OR

The sum of the numerator and denominator of a fraction is 8. If 3 is added to both the numerator and the denominator, the fraction becomes $\frac{3}{4}$. Find the fraction.

30. Prove that: $\sqrt{\frac{\sec\theta-1}{\sec\theta+1}}+\sqrt{\frac{\sec\theta+1}{\sec\theta-1}}=2\operatorname{cosec}\theta$

OR

Without using trigonometric table, find the value of $\frac{\cos 70^\circ}{\sin 20^\circ}+\frac{\cos 59^\circ}{\sin 31^\circ}-8\sin^2 30^\circ$

31. If the point (x, y) is equidistant from the points (a + b, b − a) and (a − b, a + b), then prove that bx = ay.

32. One card is drawn from a pack of 52 cards, each of which is equally likely to be drawn. Find the probability that the card drawn is

i. either red or king
ii. a red face card
iii. '10' of a black suit

OR

Find the mean for the following distribution:

Class Interval	0-10	10-20	20-30	30-40	40-50
Frequency	10	6	8	12	5

33. Right circular cylinder having diameter 12 cm and height 15cm is full of ice-cream. This ice-cream is to be filled in cones of height 12cm and diameter 6cm having a hemispherical shape on the top. Find the number of such cones which can be filled with ice-cream.

34. If the zeros of the polynomial $f(x) = x^3 - 3x^2 + x + 1$ are $a - b$, a, $a + b$, find a and b.

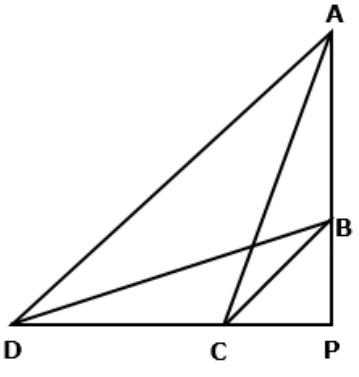
Section D

35. Draw a circle of radius 4 cm. Take a point P outside the circle. Without using the centre of the circle, draw two tangents to the circle from point P.

36. If two triangles are equiangular, prove that the ratio of the corresponding sides is same as the ratio of the corresponding altitudes.

OR

In a quadrilateral ABCD, given that $\angle A + \angle D = 90°$. Prove that $AC^2 + BD^2 = AD^2 + BC^2$.



37. By increasing the list price of a book by Rs. 10, a person can buy 10 less books for Rs. 1200. Find the original list price of the book.

38. From a window of a house in a street, h metres above the ground, the angles of elevation and depression of the top and the foot of another house on the opposite side

of the street are α and β respectively. Show that the height of the opposite house is h(1+ tan α . cot β) metres.

OR

A man in a boat rowing away from a light house 100 m high, takes 2 minutes to change the angle of elevation of the top of the light house from 60^o to 45^o. Show that the speed of the boat is $50\left(\frac{3-\sqrt{3}}{3}\right)$ m/min.

39. For the data given below draw less than ogive curve.

Marks	0 - 10	10 - 20	20 – 30	30 - 40	40 - 50	50 – 60
Number of students	7	10	23	51	6	3

40. A bucket is raised from a well by means of a rope which is wound around a wheel of radius 38.5 cm. Given that the bucket ascends in 1 min 28 seconds with a uniform speed of 1.1 m/ sec. Calculate the number of complete revolutions the wheel makes in raising the bucket.

OR

The surface area of a solid metallic sphere is $616cm^2$. It is melted and recast into smaller spheres of diameter 3.5 cm. How many such spheres can be obtained?