Class IX Session 2024-25
Subject - Mathematics
Sample Question Paper - 2

Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 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 carrying 04 marks each.
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 π =22/7 wherever required if not stated.

Section A

1. $\sqrt{12} \times \sqrt{15}$ = **[1]**

   a) 5 b) $5\sqrt{6}$

   c) $6\sqrt{5}$ d) 6

2. The graph of y = 6 is a line **[1]**

   a) Parallel to x-axis at a distance 6 units from the origin b) Making an intercept 6 on the x- axis.

   c) Making an intercept 6 on both the axes. d) Parallel to y-axis at a distance 6 units from the origin

3. Point (- 10,0) lies **[1]**

   a) on the negative direction of the y-axis b) on the negative direction of the X-axis

   c) in the third quadrant d) in the fourth quadrant

4. In a histogram the class intervals or the groups are taken along **[1]**

   a) X-axis b) Y-axis

   c) both of X-axis and Y-axis d) in between X and Y axis

5. If (2, 0) is a solution of the linear equation 2x + 3y = k, then the value of k is **[1]**

   a) 2 b) 4

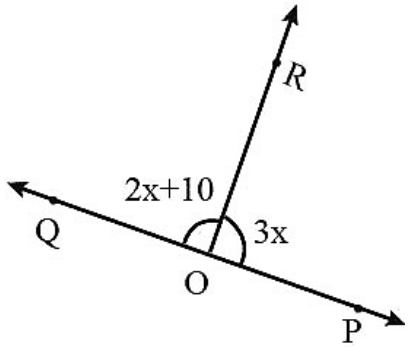
   c) 5 d) 6

6. The line segment with one end point at the centre and the other at any point on the circle is called _____. **[1]**

a) diameter b) sector

c) chord d) radius

7. Given $\angle POR = 3x$ and $\angle QOR = 2x + 10°$. If $\angle POQ$ is a straight line, then the value of x is **[1]**



a) 36° b) 30°

c) 34° d) 42^o

8. A diagonal of a Rectangle is inclined to one side of the rectangle at an angle of 25°. The Acute Angle between the diagonals is : **[1]**

a) 115° b) 40°

c) 50° d) 25°

9. The remainder when $x^{31} - 31$ is divided by $x + 1$ is **[1]**

a) -32 b) 31

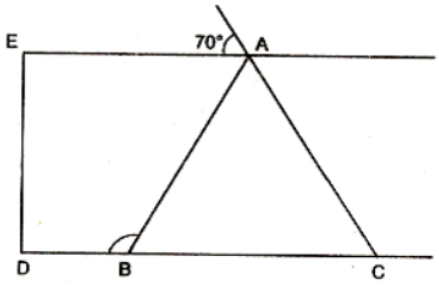
c) 30 d) 0

10. A linear equation in two variables is of the form ax + by + c = 0, where **[1]**

a) $a \neq 0$ and b = 0 b) a = 0 and b = 0

c) $a \neq 0$ and $b \neq 0$ d) a = 0 and $b \neq 0$

11. In figure, if AE||DC and AB = AC, the value of $\angle ABD$ is **[1]**



a) 110° b) 120°

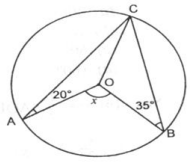
c) 130° d) 70°

12. Two adjacent angles of a parallelogram are in the ratio 4 : 5. The angles are **[1]**

a) 90°, 90° b) 80°, 100°

c) 60°, 120° d) 40°, 140°

13. In the given figure, a circle is centred at O. The value of x is : **[1]**



a) 110^o b) 55^o

c) 125^o d) 70^o

14. If $\sqrt{3} = 1.732$ and $\sqrt{2} = 1.414$, then the value of $\frac{1}{\sqrt{3}-\sqrt{2}}$ is **[1]**

a) 3.146 b) $\frac{1}{3.146}$

c) 0.318 d) $\frac{1}{\sqrt{1.732}-\sqrt{1.414}}$

15. The line represented by the equation x + y = 16 passes through (2, 14). How many more lines pass through the point (2, 14) **[1]**

a) 10 b) 2

c) many d) 100

16. In a $\triangle ABC$, if $\angle A - \angle B = 42^\circ$ and $\angle B - \angle C = 21^\circ$ then $\angle B$ = ? **[1]**

a) 95^o b) 63^o

c) 53^o d) 32^o

17. $\sqrt{3}$ is a polynomial of degree. **[1]**

a) 0 b) 2

c) $\frac{1}{2}$ d) 1

18. An icecream cone has hemispherical top. If the height of the cone is 9 cm and base radius is 2.5 cm, then the volume of icecream is **[1]**

a) 91.67 cm^3 b) 96.67 cm^3

c) 90.67 cm^3 d) 91.76 cm^3

19. **Assertion (A):** The height of the triangle is 18 cm and its area is 72 cm^2. Its base is 8 cm. **[1]**
Reason (R): Area of a triangle = $\frac{1}{2} \times$ base $\times$ height

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

20. **Assertion (A):** The point (0, 3) lies on the graph of the linear equation 3x + 4y = 12. **[1]**
Reason (R): (0, 3) satisfies the equation 3x + 4y = 12.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

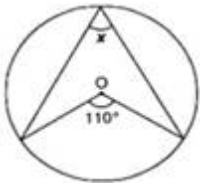
c) A is true but R is false. d) A is false but R is true.

Section B

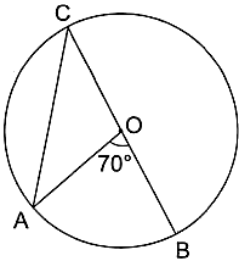
21. ABC and ADC are two right triangles with common hypotenuse AC. Prove that $\angle$ CAD = $\angle$ ABD. **[2]**

22. Find the area of equilateral triangle whose side is 12 cm using Heron's formula. **[2]**

23. Find an angle marked as x in given figure where O is the centre of the circle: **[2]**

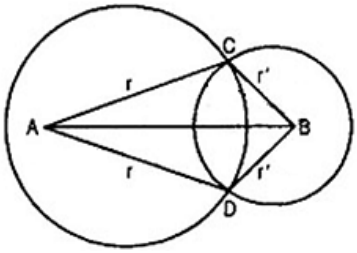


24. In the given figure, O is the centre of the circle and ∠AOB = 70°. Calculate the values of (i) ∠OCA, (ii) ∠OAC. **[2]**



OR

Prove that the line of centres of two intersecting circles subtends equal angles at the two points of intersection.



25. The following values of x and y are thought to satisfy a linear equation : **[2]**

x	1	2
y	1	3

OR

Cost of pen is two half times the cost of a pencil. Express this situation as a linear equation in two variable.

Section C

26. Locate $\sqrt{3}$ on the number line. **[3]**

27. If $x^2 + \frac{1}{x^2} = 34$, find $x^3 + \frac{1}{x^3} - 9$. **[3]**

28. The cost of leveling the ground in the form of a triangle having the sides 51m, 37m and 20m at the rate of Rs.3 per m^2 is Rs.918. State whether the statement is true or false and justify your answer. **[3]**

OR

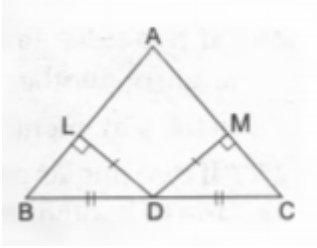
The sides of a triangular plot are in the ratio of 3 : 5 : 7 and its perimeter is 300 m. Find its area.

29. A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3 m. Find its volume. The heap is to be covered by canvas to protect it from rain. Find the area of the canvas required. **[3]**

30. △ABC is an isosceles triangle in which AB = AC. Side BA is produced to D such that AD = AB. Show that ∠BCD is a right angle. **[3]**

OR

In $\Delta ABC, D$ is the midpoint of BC. if $DL \perp AB$ and $DM \perp AC$ such that DL = DM. prove that AB = AC.



31. Draw the graphs of y = x and y = -x in the same graph. Also find the co-ordinates of the point where the two lines intersect. **[3]**

Section D

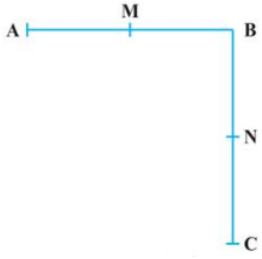
32. If $a = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $b = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, then find the value of $a^2 + b^2 - 4ab$. **[5]**

OR

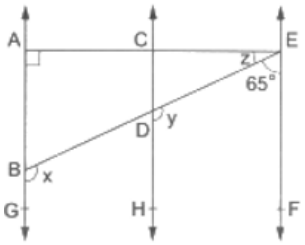
If x is a positive real number and exponents are rational numbers, simplify $\left(\frac{x^b}{x^c}\right)^{b+c-a} \cdot \left(\frac{x^c}{x^a}\right)^{c+a-b} \cdot \left(\frac{x^a}{x^b}\right)^{a+b-c}$.

33. i. AB = BC, M is the mid-point of AB and N is the mid-point of BC. Show that AM = NC. **[5]**

ii. BM = BN, M is the mid-point of AB and N is the mid-point of BC. Show that AB = BC.

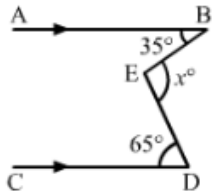


34. In the given figure, AB || CD || EF, $\angle DBG = x, \angle EDH = y, \angle AEB = z, \angle EAB = 90^\circ$ and $\angle BEF = 65^\circ$. Find the values of x, y and z. **[5]**



OR

In each of the figures given below, AB || CD. Find the value of x° in each case.



35. The following table shows the average daily earnings of 40 general stores in a market, during a certain week: **[5]**

Daily earning (in rupees)	700-750	750-800	800-850	850-900	900-950	950-1000
Number of stores	6	9	2	7	11	5

Draw a histogram to represent the above data.

Section E

36. **Read the following text carefully and answer the questions that follow:** **[4]**

Vinod and Basant have an adventure tourism business in Rishikesh. They have a resort in Rishikesh but now they are planning to build some tent houses too.

The newly built tent house will have all the basic amenities and it will attract the young tourists coming for

adventure. Their conical tent is 9 m high and the radius of its base is 12 m.

i. What is the cost of the canvas required to make it, if 1 m^2 canvas costs ₹ 10? (1)

ii. How many persons can be accommodated in the tent, if each person requires 2 m^2 on the ground? (1)

iii. How many persons can be accommodated in the tent, if each person requires 15 m^3 of space to breathe in? (2)

OR

If each person requires 20 m^3 of space to breathe in and 100 person can be accommodated then what should be height of tent? (2)

37. **Read the following text carefully and answer the questions that follow:** **[4]**

Reeta was studying in the class 9th C of St. Surya Public school, Mehrauli, New Delhi-110030

Once Ranjeet and his daughter Reeta were returning after attending teachers' parent meeting at Reeta's school. As the home of Ranjeet was close to the school so they were coming by walking.

Reeta asked her father, "Daddy how old are you?"

Ranjeet said, "Sum of ages of both of us is 55 years, After 10 years my age will be double of you.

i. What is the second equation formed? (1)

ii. What is the present age of Reeta in years? (1)

iii. What is the present age of Ranjeet in years? (2)

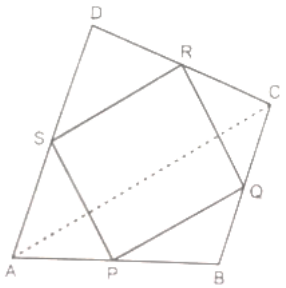
OR

If the ratio of age of Reeta and her mother is 3 : 7 then what is the age of Reeta's mother in years? (2)

38. **Read the following text carefully and answer the questions that follow:** **[4]**

Modern curricula include several problem-solving strategies. Teachers model the process, and students work independently to copy it. Sheela Maths teacher of class 9^{th} wants to explain the properties of parallelograms in a creative way, so she gave students colored paper in the shape of a quadrilateral and then ask the students to make

a parallelogram from it by using paper folding.



i. How can a parallelogram be formed by using paper folding? (1)

ii. If $\angle RSP = 30^o$, then find $\angle RQP$. (1)

iii. If $\angle RSP = 50^o$, then find $\angle SPQ$? (2)

OR

If SP = 3 cm, Find the RQ. (2)