

O. P. JINDAL SCHOOL, SAVITRI NAGAR**Annual Examination(2023-24)**

Class: IX

MM: 80

Subject: Mathematics

SET-A

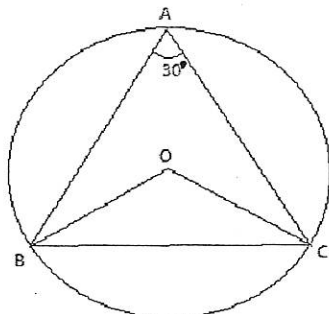
Time: 3 Hrs.

Fifteen Minutes Extra will be for reading the Question Paper.**General Instructions:**

1. This Question paper consists of five sections i.e, A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.
7. There is no overall choices, however Internal choice is provided in 2 questions of Section -B, 2 questions of Section-C and 2 questions of Section-D. You have to attempt only one of the alternatives in all such questions.

SECTION -A

1. The decimal expansion of the number $\sqrt{2}$ is
 - a) a finite decimal
 - b) 1.41421
 - c) non-terminating recurring
 - d) non-terminating non-recurring
2. The product of two irrational numbers is:
 - a) Always an integer
 - b) Always a rational number
 - c) Always an irrational number
 - d) Sometimes rational and sometimes irrational
3. Which of the following is not an irrational number?
 - a) $\sqrt{15}$
 - b) $\sqrt{(12/3)}$
 - c) $\sqrt{45/9}$
 - d) $\sqrt{18}$
4. The zero of the polynomial $p(x) = 3x - 8$ is
 - a) $-8/3$
 - b) $-3/8$
 - c) $8/3$
 - d) $3/8$
5. The degree of a zero polynomial is
 - a) 0
 - b) 1
 - c) Any natural number
 - d) Not defined
6. The value of the polynomial $x^3 + x^2 - x - 1$ at $x = -1$ is _____
 - a) -1
 - b) -2
 - c) -3
 - d) 0
7. What is the distance of the point $(-2,5)$ from Y-axis?
 - a) 3
 - b) 2
 - c) 5
 - d) none of these
8. What is another name of Y-coordinate of a point.
 - a) Abscissa
 - b) Ordinate
 - c) Coordinate
 - d) Quadrant
9. Abscissa of a point is positive in
 - a) I and II quadrants
 - b) I and IV quadrants
 - c) I quadrant only
 - d) II quadrant only
10. In the given figure, O is the center of a circle and $\angle BAC = 30^\circ$, then $\angle OBC$ is



- a) 60°
- b) 45°
- c) 40°
- d) 70°

SECTION -B

21. Factorize: $64a^3 - 27b^3 - 144a^2b + 108ab^2$

22. If a point (3,-4) is the solution of the linear equation $2x - 5y = k$. Find the value of k.

23. Find the curved surface area of a cone of radius 14 cm and whose slant height is 50 cm.

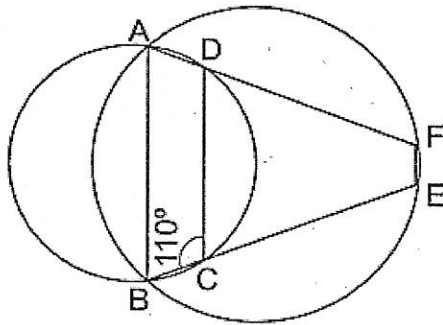
OR

Find the total surface area of a hemisphere of diameter 7cm.

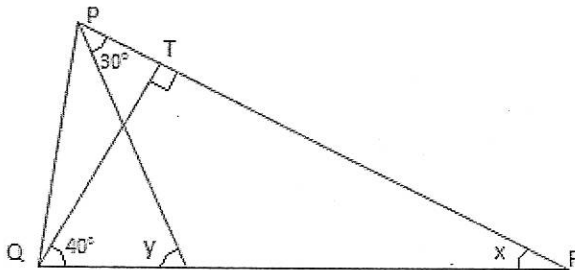
24. ABCD is a cyclic quadrilateral in which $AB \parallel CD$. If $\angle D = 70^\circ$, find all the remaining angles.

OR

In the given figure ABCD and ABEF are cyclic quadrilaterals. If $\angle BCD = 110^\circ$ then find $\angle BEF = ?$



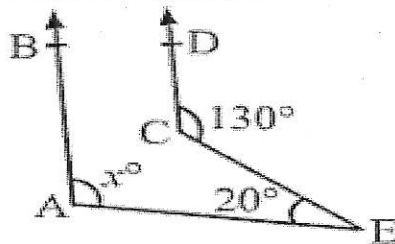
25. In the given figure, $QT \perp PR$, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$. Find x and y.



SECTION -C

26. Find the values of a and b if $\frac{3-2\sqrt{2}}{3+2\sqrt{2}} = a+b\sqrt{2}$

27. In the given figure, $AB \parallel CD$. Find the value of x.



28. Factorise: $x^3 + 6x^2 + 11x + 6$

OR

Find the value of k, if $x - 2$ is a factor of $p(x) = 3x^3 + 5x^2 - kx + 12$.

29. An umbrella is made by stitching ten triangular pieces of cloth, each measuring 60 cm, 60 cm, and 20 cm. Find the area of the cloth required for the umbrella.

OR

Sides of a triangle are in the ratio of 3: 4: 5 and its perimeter is 24 cm. Find its area.

30. The hollow sphere in which the circus Motorcyclist performs his stunt has a diameter of 7m. Find the area available to the Motorcyclist for riding. What is the volume of air present in the hollow sphere?

31. Find three solutions of the linear equation $2x + 3y = 12$. Also draw its graph.

SECTION -D

32. A circular park of radius 20 m is situated in a colony. Three boys Ankur, Syed and David are sitting at equal distance on its boundary each having a toy telephone in his hands to talk each other. Find the length of the string of each phone.

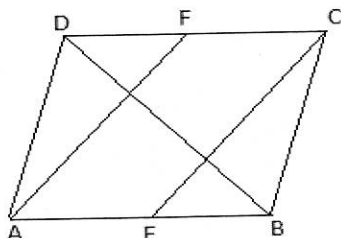
OR

Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4 cm. Find the length of the common chord.

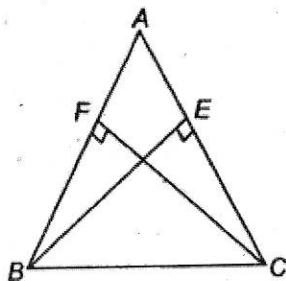
33. Show that the diagonals of a rhombus bisect each other and are perpendicular to each other.

OR

In a parallelogram ABCD, E and F are the mid points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD.



34. $\triangle ABC$ is a triangle in which altitudes BE and CF are drawn to sides AC and AB respectively are equal. (see figure). Show that $\triangle ABC$ is an isosceles triangle.



35. Draw a histogram to represent the following grouped frequency.

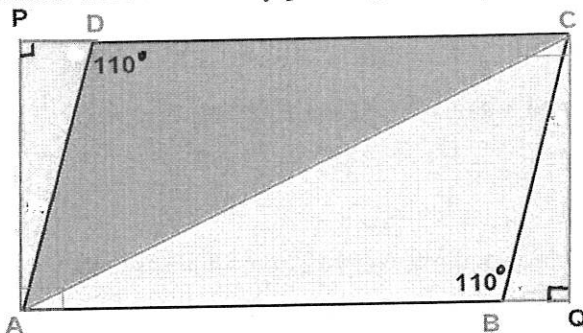
Age(in years)	10-14	15-19	20-24	25-29	30-34	35-39	40-44
No. of Persons	12	20	25	32	30	24	15

Also draw frequency polygon.

SECTION - E

Read the passage given below and answer the questions accordingly:

36. In the middle of the city, there was a park ABCD in the form of a parallelogram form so that $AB = CD$, $AB \parallel CD$ and $AD = BC$, $AD \parallel BC$. Municipality converted this park into a rectangular form by adding land in the form of $\triangle APD$ and $\triangle BCQ$. Both the triangular shape of land were covered by planting flower plants.



- (i) Show that $\triangle APD$ and $\triangle BCQ$ are congruent.
 (ii) PD is equal to which side?

(1)

OR

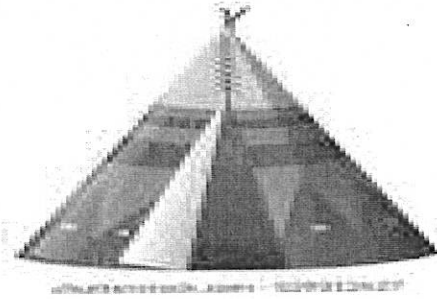
What is the value of $\angle PAD$?

(1)

(iii) Show that $\triangle ABC$ and $\triangle CDA$ are congruent.

(2)

37. Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. So they purchased canvas cloth at the rate of Rs 4 per m^2 and made a tent with height 6 m and diameter 16 m as shown in figure

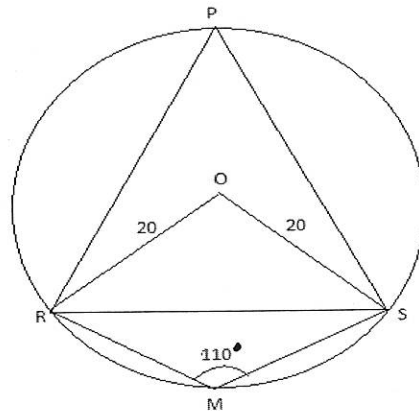


- (i) What is the slant height of the tent? (1)
- (ii) How much Cloth is used for making tent? (1)
- (iii) What is the volume of air in the tent? (2)

OR

What is the total cost of canvas cloth required to make the tent?

38. Four Friends Mahesh, Piyush, Shyam, and Rohan are sitting on the circumference of a circular park of radius 20m. Their locations are marked by points M, P, S, and R as shown in the fig. Amit joins them and sits at the center of the circular park, so he is equidistant from all the other friends. His position is marked as O. They are sitting in such a way that $\angle SMR = 110^\circ$.



- (i) What is a measure of reflex $\angle SOR$? (1)
- (ii) What is the measure of $\angle SPR$? (1)
- (iii) Find $\angle OSR$? (2)

OR

If the distance of line segment SR from the centre O of circle is 6m, what is the distance between Shyam and Rohan?

