

THIRD TERM EXAMINATION

MATHEMATICS

(Class IX)

(Areas of parallelogram, Circles, Construction, SA and Volume and Probability)

Question Paper

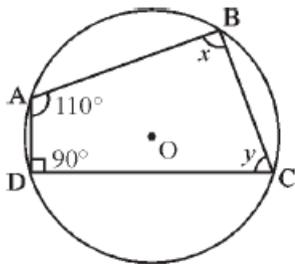
SECTION –A

(10x1=10)

1) If sum of two parallel sides of a trapezium is 15 cm and its area is 30 cm^2 , then the height of the trapezium is :

- (a) 2 cm (b) 4 cm (c) 6 cm (d) 8 cm

2) ABCD is a cyclic quadrilateral as shown in the figure. The value of $(x + y)$ is

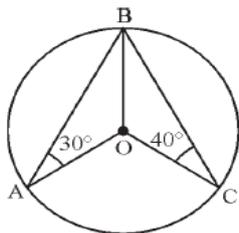


- (a) 200° (b) 100° (c) 180° (d) 160°

3) Number of matchsticks in 25 matchboxes were recorded as below : 51, 48, 50, 47, 52, 50, 51, 50, 46, 48, 47, 50, 51, 54, 45, 46, 49, 47, 48, 52, 49, 50, 48, 52, 48. If one matchbox is chosen at random, the probability that it contains exactly 50 matchsticks is :

- (a) 1 (b) $1/5$ (c) $2/5$ (d) $1/25$

4) In the figure, O is the centre of the circle, find AOC, given $\angle BAO = 30^\circ$ and $\angle BCO = 40^\circ$.



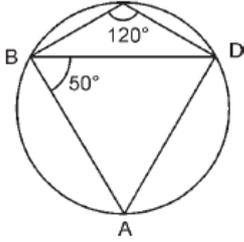
- (a) 35° (b) 140° (c) 70° (d) cannot be determined

5) The longest needle that can be placed in a cylinder of radius of r units and height h units _____

- a) $\sqrt{4r^2 + h^2}$ b) $\sqrt{3r^2 + h^2}$ c) $\sqrt{4r^2 - h^2}$ d) $\sqrt{3r^2 + 2h^2}$

6) If the radius of a sphere is doubled, what is the ratio of the volume of the first sphere to that of the second sphere ?

7) In the figure ABCD is a cyclic quadrilateral. If $\angle BCD = 120^\circ$ and $\angle ABD = 50^\circ$, find $\angle ADB$.



8) In a class, there are x girls and y boys. A student is selected at random, then the probability of selecting a boy is _____

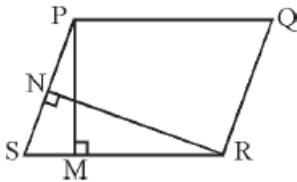
9) If the slant height of a cone is double its base radius, then volume of the cone is _____

10) The surface area of a sphere is 154 cm^2 , then its diameter is _____

SECTION –B

(5x2=10)

11) In the figure, PQRS is a parallelogram, $PM \perp RS$ and $RN \perp PS$. If $PQ = 12 \text{ cm}$, $PM = 6 \text{ cm}$ and $RN = 8 \text{ cm}$, then find the length of PS



12) The radius of a circle is 5 cm and the length of a chord in the circle is 8 cm. Find the distance of the chord from the centre of the circle

13) A right circular cone is 8 cm high and radius of its base is 2 cm. The cone is melted and recast into a sphere. Determine the diameter of the sphere.

14) It is known that a box of 550 bulbs contains 22 defective bulbs. One bulb is taken out at random from the box. Find the probability of getting:

(i) defective bulb

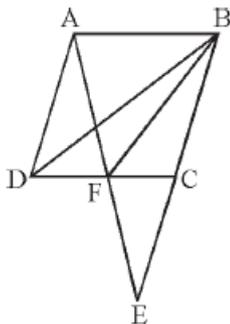
(ii) good bulb.

15) Using pair of compasses construct an angle 75°

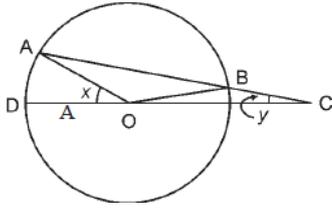
SECTION –C

(6x3=18)

16) In the figure, ABCD is a parallelogram in which BC is produced to E such that $CE = BC$. AE intersects CD at F. Show that $\text{ar}(\triangle BDF) = \frac{1}{4} \text{ar}(ABCD)$.



17) In the figure, chord AB of circle with centre O is produced to C such that $BC = OB$. CO is joined and produced to meet the circle in D. If $\angle ACD = y$ and $\angle AOD = x$, show that $x = 3y$.

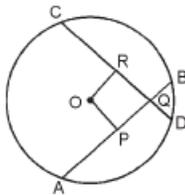


18) 100 cards marked from 2 to 101 are placed in a box and mixed thoroughly. One card is drawn at random from the box. Find the probability that number on the card is

- (i) an even number
- (ii) a number which is a perfect square
- (iii) a prime number less than 20

19) Three solid cubes have a face diagonal of $4\sqrt{2}$ cm each. Three other cubes have a face diagonal of $8\sqrt{2}$ cm each. All the cubes are melted together to form big cube. Find the side of the cube formed?

20) In the figure, equal chords AB and CD intersect each other at Q at right angle. P and R are mid points of AB and CD respectively. Show that OPQR is a square.



21) The difference between the outer lateral surface area and inner lateral surface area of a cylindrical metallic pipe 28 cm long is 176 Square cm. Find the outer and inner radii of the pipe, if the pipe is made of 352 Cubic cm of metal.

SECTION-D

(3x4=12)

22) AB and AC are two chords of a circle of radius r units. If $AB = 2AC$, and the length of the perpendicular from the centre on these chords are a and b respectively then prove that

$$4b^2 = a^2 + 3r^2.$$

23) How many cylindrical glasses of 3 cm base radius and height 8 cm can be refilled from a cylindrical vessel of base radius 15 cm which is filled upto a height of 32 cm?

24) Construct a triangle ABC in which $BC = 5$ cm $\angle B = 45^\circ$ and $AB - AC = 2.8$ cm and Justify your construction.