

8. Out of 45 students participating in a competition , 25 are girls. The probability that the winner is a boy is
 a) $\frac{5}{9}$ b) $\frac{2}{9}$ c) $\frac{4}{9}$ d) $\frac{1}{9}$

SECTION B

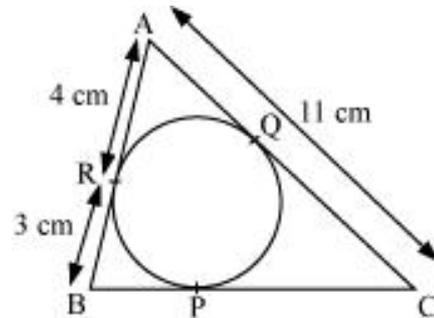
(6 x 2 = 12)

9. First term of an A.P is -5 and its last term is 45 . If the sum of these terms is 120 , find the number of terms.
10. Find the value of 'p' for which the points $(-1,-1)$, $(2, p)$ and $(8,11)$ are collinear.

OR

The co-ordinates of the mid-point of the line segment joining $(3p, 4)$ and $(-2,2q)$ are $(5, 3)$. Find the values of p and q.

11. In the figure, $AR = 4\text{cm}$, $BR = 3\text{cm}$ and $AC = 11\text{cm}$. Find the length of BC .



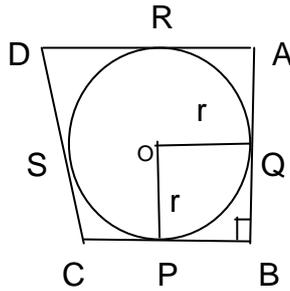
12. Find the volume of a frustum of a cone whose height is 4 m and radii of the ends are 7 m and 4 m .
13. Determine the value of p for which $9y^2 - 24y + p = 0$ has equal roots.
14. Two cubes each of side 10 cm are joined end to end. Find the surface area of the resulting cuboid.

SECTION C

(10 x 3= 30)

15. Volumes of two hemispheres are in the ratio $64 : 27$. Find the ratio of their curved surface areas.
16. A card is drawn at random from a well shuffled deck of 52 playing cards. Find the probability that the card drawn is a) a black king b) an ace .

17. A tent is cylindrical upto a height of 3 m and conical above it. If the diameter of the base is 105 m and slant height of the conical part is 53 m , find the total cost of canvas used to make the tent at Rs 10 per square metre.
18. A circle is inscribed in a quadrilateral ABCD where $\angle B = 90^\circ$. If AD = 24 cm, AB = 30 cm and DS = 8 cm, find the radius 'r' of the circle.



19. The sum of 4th and 8th terms of an A.P is 37 and the sum of 6th and 12th terms is 46. Find the first term of the A.P.
20. Construct a pair of tangents to a circle of radius 3 cm from a point P at a distance of 5 cm from the centre.
- OR**
- Construct $\triangle PQR$ with $PQ = 6\text{cm}$, $QR = 7\text{cm}$ and $\angle Q = 60^\circ$ and then another triangle similar to it whose sides are $\frac{5}{4}$ of the corresponding sides of $\triangle PQR$.
21. An observer 1.7 m tall is 30.3 m away from the foot of a tower. The angle of elevation of top of the tower from her eyes is 45° . Find the height of the tower.
22. Solve for x : $3a^2x^2 + 8abx + 4b^2 = 0$.

OR

$$\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x} \quad (x \neq 0, 1, 2)$$

23. Students of class X packed 500 packets of biscuits each of dimension $6\text{cm} \times 3\text{cm} \times 2\text{cm}$ in boxes each of volume 1800cm^3 to be distributed to the children of flood victims.
- Find the number of boxes required.
 - Which mathematical concept is used here ?
 - What moral values are represented by the class X students?
24. Determine the sum of all multiples of 9 lying between 100 and 200.

OR

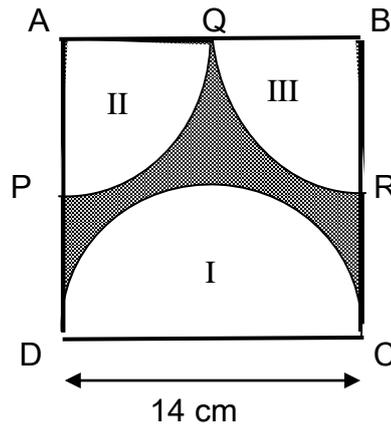
Find the sum of first 20 terms of an A.P whose n^{th} term is $4n - 1$.

SECTION D

(10 x 4 = 40)

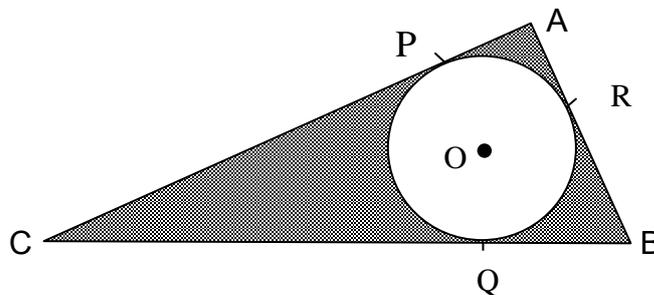
25. Prove that the lengths of the tangents drawn from an external point to a circle are equal.
26. A plane covers a distance of 1200 km at a uniform speed. Had the speed been 100 km/hr more, it takes 1 hour less for the journey. Find its original speed.
- OR**
- A motor boat whose speed is 18 km/hr in still water, takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.
27. If $P(2, -1)$, $Q(3, 4)$, $R(-2, 3)$ and $S(-3, -2)$ are four points in a plane, show that PQRS is a rhombus but not a square.
28. Cards marked with numbers 1, 2, 3, ..., 40 are placed in a box and mixed thoroughly. One card is drawn at random from the box. Find the probability that the number on the drawn card is
- divisible by 3 and 5
 - a prime number
 - a perfect square

29. The curved surface of a 16 m deep cylinder is plastered with concrete at the rate of Rs 15 per m^2 . If the total cost of plastering the curved surface is Rs 5280, find the capacity of the cylinder.
30. Find the shaded area if ABCD is a square, region I is a semicircle with diameter 14 cm, region II and III are quadrants with centres at A and B respectively.



OR

In $\triangle ABC$, $\angle A = 90^\circ$, $AB = 6$ cm, $BC = 10$ cm and $AC = 8$ cm. Find the radius of the circle and the shaded area if O is the centre of the incircle of $\triangle ABC$.



31. A man saves Rs 320 during the first month, Rs 360 in the second month Rs 400 in the third month and so on. If he continues his savings in this sequence, in how many months will he save a total of Rs 20000 ?

32. The sum of the radius of the base and the height of a solid cylinder is 37 cm. If the total surface area of the cylinder is 1628 cm^2 , find the radius and volume of the cylinder (use $\pi = 22/7$).

OR

The height of a cone is 32 cm. A small cone is cut off at the top by a plane parallel to its base. If its volume is $\frac{1}{64}$ of the volume of the given cone, at what height above the base, is the cone cut? (use $\pi = 22/7$)

33. Find the ratio in which the y-axis divides the line segment joining the points $(5, -6)$ and $(-1, -4)$. Also find the co-ordinates of the point of division.
34. Two poles are erected on either bank of a river just opposite to each other. One pole is 40 m high. From the top and foot of this pole, the angles of elevation of top of the other pole are 30° and 60° respectively. Find the height of the other pole and width of the river.
