

Geometry

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1. (a) Write the expression for the volume of the cone of radius 'r' and height three times the radius 'r'.
(b) Write the expression for total surface area of a solid hemisphere of radius 'r'.
2. A vertical pole is 100 metres high. Find the angle subtended by the pole at a point on the ground $100\sqrt{3}$ meters from the base of the pole.
3. (a) Find the area of that sector of a circle of radius 3.5cm whose central angle is 90° .
(b) The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.
(Take $\pi = \frac{22}{7}$)
4. A semicircular ground of radius 1.5 m is to be fenced with wire. Find the cost of wiring at the rate of ₹30 per metre.
5. (a) The angle of elevation of the top of a tower from a point is found to be 60° . At a point 40 m above the first point, the angle of elevation of the top of the tower is 45° . Find the height of the tower.
(b) A statue 1.6m tall stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of statue is 60° and from the same point, the angle of elevation of the top of the pedestal is 45° . Find the height of the pedestal.
6. The areas of two similar triangles are 121cm^2 and 64cm^2 respectively. If one median of the first triangle is 12.1 cm long, then find the length of the corresponding median of the other triangle.
7. (a) In a triangle ABC , a line is drawn parallel to base BC meeting AB in D and AC at E . If $\frac{AB}{BD} = 4$ and $CE = 2\text{cm}$, BD then find the value of AE .
(b) Two poles, 6m and 11 m high, stand vertically on the ground. If the distance between their feet is 12 m, find the distance between their tops.

8. Answer any **four** of the following questions :

(i) If the sum of the areas of two circles with radii r_1 and r_2 is equal to the area of a circle of radius r , then

- (A) $r_1 + r_2 = r$
- (B) $r_1^2 + r_2^2 = r^2$
- (C) $r_1 + r_2 < r$
- (D) $r_1^2 + r_2^2 < r^2$

(ii) The area of a circle that can be inscribed in a square of side 8 cm is

- (A) $64\pi\text{cm}^2$
- (B) $24\pi\text{cm}^2$
- (C) $16\pi\text{cm}^2$
- (D) $8\pi\text{cm}^2$

(iii) The area of a square that can be inscribed in a circle of radius 6 cm is

- (A) 36 cm^2
- (B) 72 cm^2
- (C) 18 cm^2
- (D) $32\sqrt{2}\text{ cm}^2$

(iv) The radius of a circle whose circumference is equal to the sum of the circumferences of two circles of diameters 36 cm and 20cm is

- (A) 56 cm
- (B) 42 cm
- (C) 28 cm
- (D) 16 cm

(v) If the circumference of a circle is equal to the perimeter of a square, then the ratio of their areas is

- (A) 22 : 7
- (B) 14 : 11
- (C) 7 : 22
- (D) 11 : 24

9. A solid right circular cone is 4.1cm high and the radius of its base is 2.1 cm. Another solid right circular cone is 4.3 cm high and radius of its base is 2.1 cm. Both the cones are melted and recast into a sphere. Find the diameter of the sphere.

10. Answer any **four** of the following questions :

(i) The radius of a solid hemisphere is 'r' cm. It is divided into two equal hemispherical parts. The whole surface area of one part is

- (A) $2\pi r^2\text{sq.cm}$

- (B) $3\pi r^2$ sq.cm
 - (C) $\frac{2}{3}\pi r^3$ sq.cm
 - (D) $\frac{1}{3}\pi r^3$ sq.cm
- (ii) The diameter of the largest sphere that can be carved out of a cube of side 21 cm is
- (A) 42 cm
 - (B) 7 cm
 - (C) 21 cm
 - (D) $\frac{21}{2}$ cm
- (iii) The total surface area of a solid right circular cylinder having the radius of the base as 7 cm and the height as 10 cm is
- (A) 154 sq.cm
 - (B) 440 sq.cm
 - (C) 308 sq.cm
 - (D) 748 sq.cm
- (iv) A cone and a cylinder are of the same height. If the radii of their bases are in the ratio 3 : 1, then the ratio of their volumes is
- (A) 1 : 1
 - (B) 1 : 3
 - (C) 3 : 1
 - (D) 2 : 3
- (v) The slant height of a cone of radius 5 cm and height 12 cm(in cm) is
- (A) 12
 - (B) 13
 - (C) 5
 - (D) 17