Cylinder, cone and sphere

Problems

1. If volume and surface area of a sphere is numerically equal, then its radius is

   A. 2 **B.** 3 units **C.** 4 units **D.** 5 units

2. Ratio of the volume of a cone and a cylinder of same radius of base and same height is

   A. 1 : 1 **B.** 1 : 2 **C.** 1 : 3 **D.** 1 : 4

3. The diameter of a sphere is decreased by 25%, by what percentage its volume decreases?

   A. 25% **B.** 57.81% **C.** 53.5% **D.** 50%

4. The radius of a hemispherical balloon increases from 6 cm to 12 cm as air is being pumped into it. The ratios of the surface areas of the balloon in the two cases is

   A. 1 : 4 **B.** 1 : 3 **C.** 2 : 3 **D.** 2 : 1

5. A cone is 8.4 cm high and the radius of its base is 2.1 cm. It is melted and recast into a sphere. The diameter of sphere is

   A. 4.2 cm **B.** 2.1 cm **C.** 2.4 cm **D.** 1.6 cm

6. A solid sphere of radius 3 cm is melted and then recast into small spherical balls each of diameter 0.6 cm. Find the number of small balls thus obtained.

7. Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find its total surface area.

8. How many square metres of canvas is required for a conical tent whose height is 3.5 m and the radius of whose base is 12 m? (use $\pi \approx 3.14$)

9. The radius and height of a cone are in the ratio 4 : 3. The area of the base is 154 cm^2. Find the area of the curved (use $\pi \approx 3.14$).

10. The curved surface area of a cone is three times larger than the area of its base. The height of this cone is equal to 12. Calculate the volume of the cone.

11. Given a cone with a volume of 8π, in which the ratio of the height to the radius of the base is 3 : 8. Calculate the lateral surface area of this cone.

12. Mr. Kumar, a Mathematics teacher brings some green coloured clay in the classroom to teach the topic 'mensuration'. First, he forms a cylinder of radius 6 cm and height 8 cm with the clay. Then, he moulds that cylinder into a sphere similarly, he moulds the sphere in other different shapes. Answer the following questions: (use $\pi = 3.14$)

    (a) What is the volume of the cylindrical shape?

    (b) Find the radius of the sphere

    (from https://kumarsir34.wordpress.com)

13. The axial cross-section of a cone is an equilateral triangle with an area of $49\sqrt{3}$. Complete the following sentences.

    (a) The area of the cone's base equals ..... .

    (b) The volume of the cone equals ..... .

14. The rectangle $ABCD$, when rotated about the side AB, generated a cylinder c_1. The same rectangle, when rotated about the side AD, generated a cylinder c_2. The resulting cylinders have equal total surface areas. Prove that rectangle $ABCD$ is a square.

Answers

1. B.
2. C.
3. B.
4. A.
5. A.
6. 1000 balls
7. 462 cm^2
8. approx. 471 m^2.
9. approx. 192 cm^2
10. $V = 72\pi$
11. $2\sqrt{73}\pi$
12. (a) 904.32 cm^2
    (b) $R = 6$
13. (a) 49π
    (b) $V = \frac{343\sqrt{3}}{3}\pi$