2015 O/L

6. (*a*) A right circular cylindrical container made from a thin material, of height 21 cm and radius 6 cm, is filled with water up to a height of 14 cm.

Take the value of π as $\frac{22}{7}$ in the following calculations.

(i) Find the volume of the empty space in the container.

(ii) If 44 cm^3 of water spills over when a solid spherical object is immersed completely in the water of the container, then show that the radius of the spherical object is $\sqrt[3]{199.5}$ centimetres.

(*b*) Using the logarithms table, find the value of $\frac{\sqrt[3]{5}}{0.871}$.

2016 O/L

11. A solid spherical glass ball of radius 21 cm is melted and 240 identical solid cylindrical glass discs are made. Assume that there is **no** change in the volume of glass in this process. If the radius of each disc is r centimetres and height is $\frac{r}{9}$ centimetres, show that $r = \frac{21}{\sqrt[3]{20}}$ and, using the logarithms table, find the value of r correct to two decimal places.

2017 O/L

11. A solid iron sphere of radius 2 cm is melted and a solid right circular cone with the same volume as the sphere is made, such that the ratio of the base radius of the cone to its perpendicular height is 3 : 4. Show that the base radius of the cone that is made is $2 \times \sqrt[3]{3}$ cm and find its value correct to the second decimal place using the logarithms table.

2018 O/L

base of a cuboid shaped glass container of height one metre is a square. The length of a of the base is 25 cm. The container is filled with water to exactly half its height.

Find the volume of water in the container in cubic centimetres.

Rani has several identical solid right circular metal cylinders of unknown base radius and height 10 cm. To find the base radius r of a cylinder, she puts them one by one into the above container half-filled with water. When exactly 25 of them are put, the water reaches the level of the container being completely filled.

Show that $r = 5\sqrt{\frac{5}{\pi}}$ cm.

Find the value of r in centimetres to the first decimal place, by using 3.14 for the value of π.

being a family that owns only fish.

2019 O/L

12. A hemispherical container of radius r is completely filled with water. This water is poured into a glass container in the shape of a prism, having a triangular cross section with the measurements shown in the figure, such that no water spills out. Then the water fills this glass container to a height of 10 cm. Show that the radius r of the hemispherical container is obtained by $r = \sqrt[3]{\frac{180}{\pi}}$ cm, and taking the value of π as 3.14, find the value of r in centimetres to the first decimal place.