

## Answers Sheet

### Spheres and Cones

1.

$$\begin{aligned}\text{Volume} &= (1/3) \pi r^2 h \\ &= (1/3) \pi (7)^2 15 \\ &= 769\text{cm}^3\end{aligned}$$

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2.

$$\begin{aligned}\text{Area of a circle} &= \pi (8)^2 \\ &= 64\pi \\ \text{Curved area} &= 4 \pi (8)^2 / 2 \\ &= 128\pi \\ &= 64\pi + 128\pi \\ &= 192\pi \text{ cm}^2\end{aligned}$$

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3.

$$\begin{aligned}\text{Curved surface area} &= \pi (5.5) (14) \\ &= 77 \pi \\ \text{Area of circle} &= \pi (5.5)^2 \\ &= 30.25 \pi \\ &= 77\pi + 30.25\pi \\ &= 108 \text{ cm}^2\end{aligned}$$

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4.

$$\begin{aligned}\text{Volume of cone} &= (1/3) \pi (6)^2 (16) \\ &= 192 \pi \\ \text{Volume of hemisphere} &= (2/3) \pi (6)^3 \\ &= (432 / 3) \pi \\ \text{Total volume} &= 192 \pi + (432 / 3) \pi \\ &= (1008 / 3) \pi \text{ cm}^3\end{aligned}$$

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5.

$$\begin{aligned}\text{Volume of a cube} &= 9 \times 9 \times 9 \\ &= 729 \text{ cm}^3\end{aligned}$$

$$\left(\frac{4}{3}\right) \pi r^3 = 729$$

$$4 \pi r^3 = 2187$$

$$r^3 = 2187 / 4\pi$$

$$r^3 = 174.124$$

$$r = \sqrt[3]{174.124}$$

$$r = 39.58 \text{ cm}$$

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6.

$$\begin{aligned}\text{Area of circle} &= \pi (10)^2 \\ &= 100 \pi\end{aligned}$$

$$l^2 = 10^2 + 12^2$$

$$l^2 = 244$$

$$l = \sqrt{244}$$

$$l = 15.62 \text{ cm}$$

$$\begin{aligned}\text{Curved area} &= \pi (10) (15.62) \\ &= 156.2 \pi\end{aligned}$$

$$\begin{aligned}\text{Total surface area} &= 100 \pi + 156.2\pi \\ &= 256.2\pi \text{ cm}^2\end{aligned}$$

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7.

$$\begin{aligned}\text{Volume of sphere} &= \left(\frac{4}{3}\right) \pi (4.5)^3 \\ &= 121.5\pi \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Volume of water} &= 14 \times 13 \times 8 \\ &= 1456 \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Total volume} &= 381.51 \times 1456 \\ &= 555478.56 \text{ cm}^3\end{aligned}$$

$$14 \times 13 \times h = 555478.56$$

$$h = 555478.56 / 182$$

$$h = 3052.08 \text{ cm}$$

$$= 3052.08 - 10$$

$$= 3042.08 \text{ cm}$$

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