

## Class Test 2 »



Answer all questions. Show your working clearly.

1. A hollow cone has an external radius of 6 cm. The external height of the cone is 21 cm and the internal height is 4 times the internal radius. The volume of the cone is  $410 \text{ cm}^3$ . Find the internal radius of the cone. [3]

2.



Figure 1

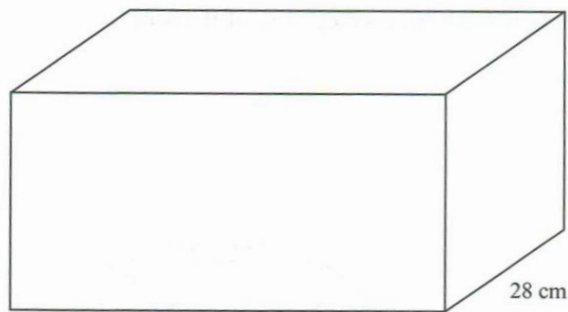


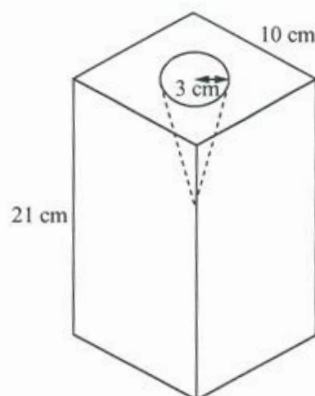
Figure 2

The density of the sphere in figure 1 is  $1.75 \text{ g/cm}^3$  and its mass is 198 g.

- (a) Find the radius of the sphere, leaving your answer correct to the nearest cm. [3]
- There is 4.662 l of water in the rectangular tank in figure 2.
- (b) Find the height of the water level in the tank. [1]
  - (c) How many spheres have to be added to the rectangular tank for the water level to reach a height of 12.5 cm? [2]

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3.



The figure above shows a solid where a cone was removed from a cuboid block with a square base of side 10 cm. The height of the cone is  $\frac{3}{5}$  of the height of the cuboid. Leaving your answers to 1 decimal place,

- (a) find the volume of the solid, [3]
- (b) find the total surface area of the solid. [3]

4.

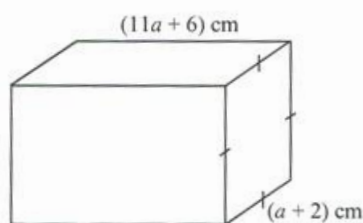


Figure 1



Figure 2

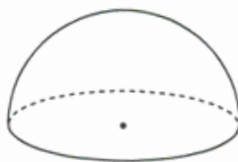
The surface area of the cuboid block in figure 1 is  $1272 \text{ cm}^2$ .

- (a) Find the value of  $a$ . [3]
- (b) The solid in figure 2 consists of 2 identical right square pyramids. The vertical height of each pyramid is 1.5 cm and the length of the side of the base is 1.2 cm.
  - (i) Find the volume of the solid. [1]
  - (ii) The cuboid block is melted to form the solid in figure 2. How many such solids can be formed? [2]

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5. A right pyramid has a regular pentagonal base with side 6 cm. The base area is  $51.8 \text{ cm}^2$ . When this pyramid is placed in a rectangular tank with base 9 cm by 14 cm, the water level rises by 3.7 cm.
- Find the height of the pyramid. [2]
  - Given that the slant height is 27.2 cm, find the total surface area of the pyramid. [2]

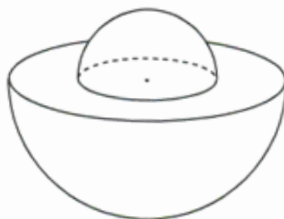
6.



The volume of the hemisphere is  $2425.5 \text{ cm}^3$ .

- Find the radius of the hemisphere. [2]
- Find the total surface area of the hemisphere. [1]

7.

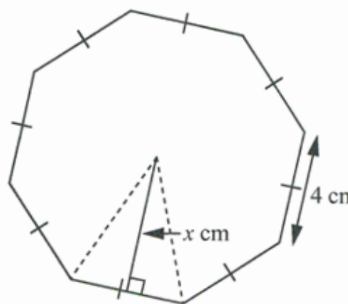


A structure consists of a smaller hemisphere connected to a larger hemisphere as shown in the figure above. The ratio of their curved surface areas is 4 : 9, and the radius of the larger hemisphere is 9 cm.

- Find the total surface area of the structure. [4]
- Find the mass of the structure if its density is  $2.5 \text{ g/cm}^3$ . [3]

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8.



The figure shows the regular octagonal base of a right pyramid, with sides 4 cm. The height of the pyramid is 18.6 cm. The volume of the pyramid is  $496 \text{ cm}^3$ .

- (a) Find the value of  $x$ . [2]
- (b) Hence, find the slant height of the pyramid. [1]
- (c) Calculate the total surface area of the figure, leaving your answer correct to 1 decimal place. [2]