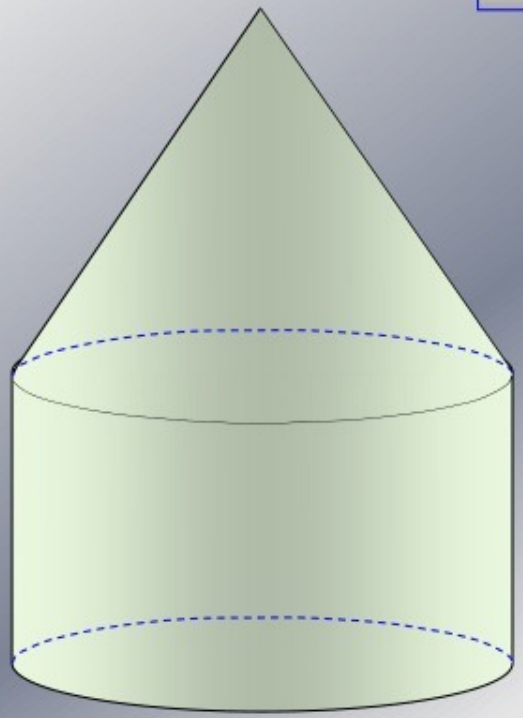
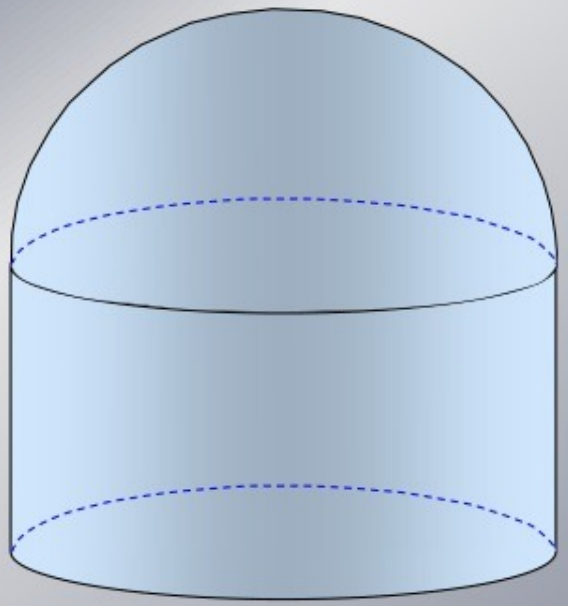
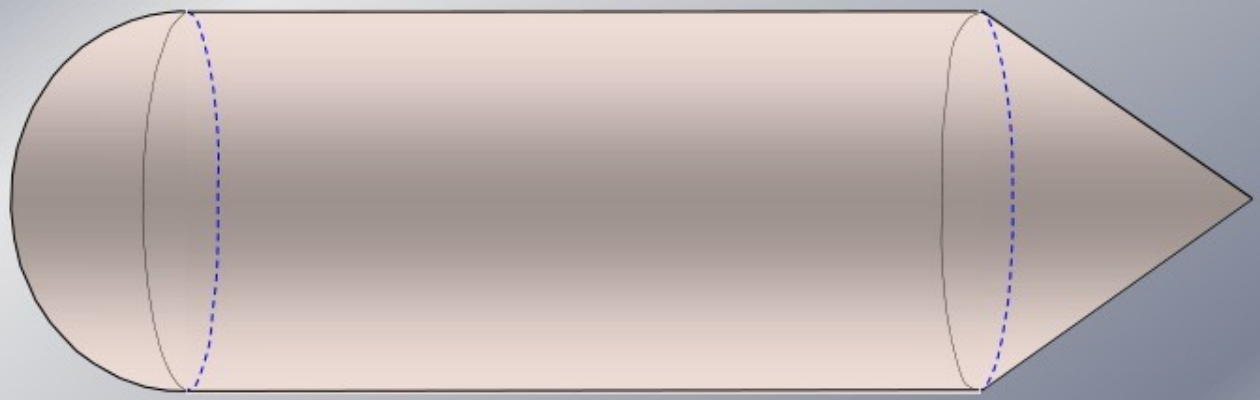
Composite Solids



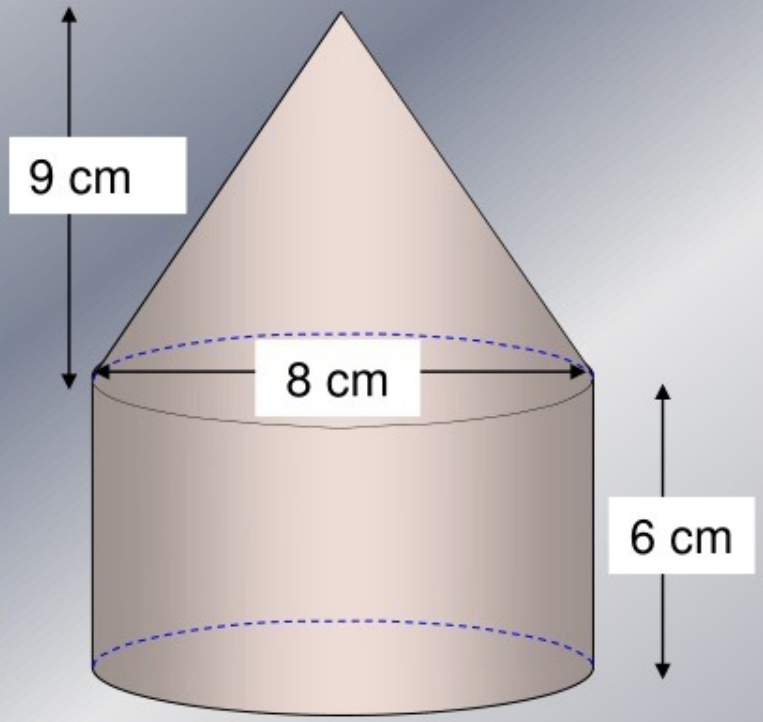




Example Question 1

Composite Solids

An aeronautical engineer designs a small component part made of copper, that is to be used in the manufacturer of an aircraft. The part consists of a cone that sits on top of a cylinder as shown in the diagram below. Find the volume of the part. (Leave your answer in terms of π).



Volume of cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 4^2 \times 9$

$= 48\pi$ cm^3

Volume of cylinder = $\pi r^2 h$

$= \pi \times 4^2 \times 6$

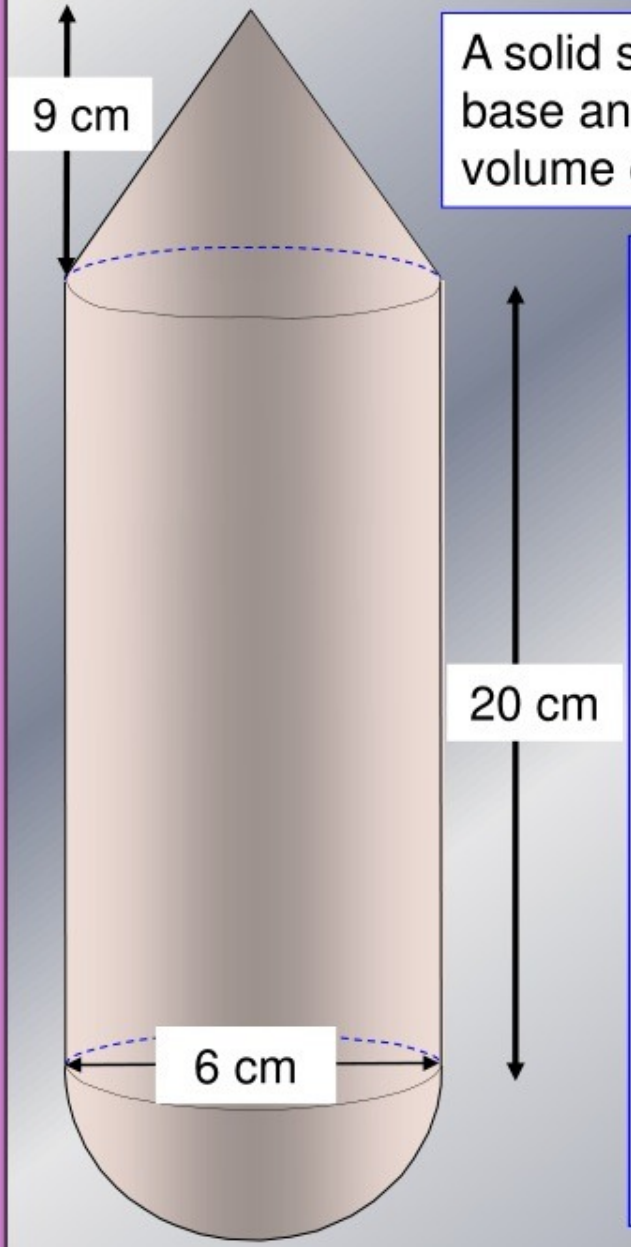
$= 96\pi$ cm^3

Total volume = $48\pi + 96\pi = \underline{144\pi \text{ cm}^3}$

Question 4

Composite Solids

A solid shape is composed of a cylinder with a hemi-spherical base and a conical top as shown in the diagram. Calculate the volume of the shape. (answer to 2 sig fig)



Volume of cone = $1/3 \times \pi r^2 h$

$= 1/3 \times \pi \times 3^2 \times 9$

$= 27\pi$ cm^3

Volume of cylinder = $\pi r^2 h$

$= \pi \times 3^2 \times 20$

$= 180\pi$ cm^3

Volume of hemi-sphere = $2/3\ \pi r^3$

$= 2/3 \times \pi \times 3^3$

$= 18\pi$ cm^3

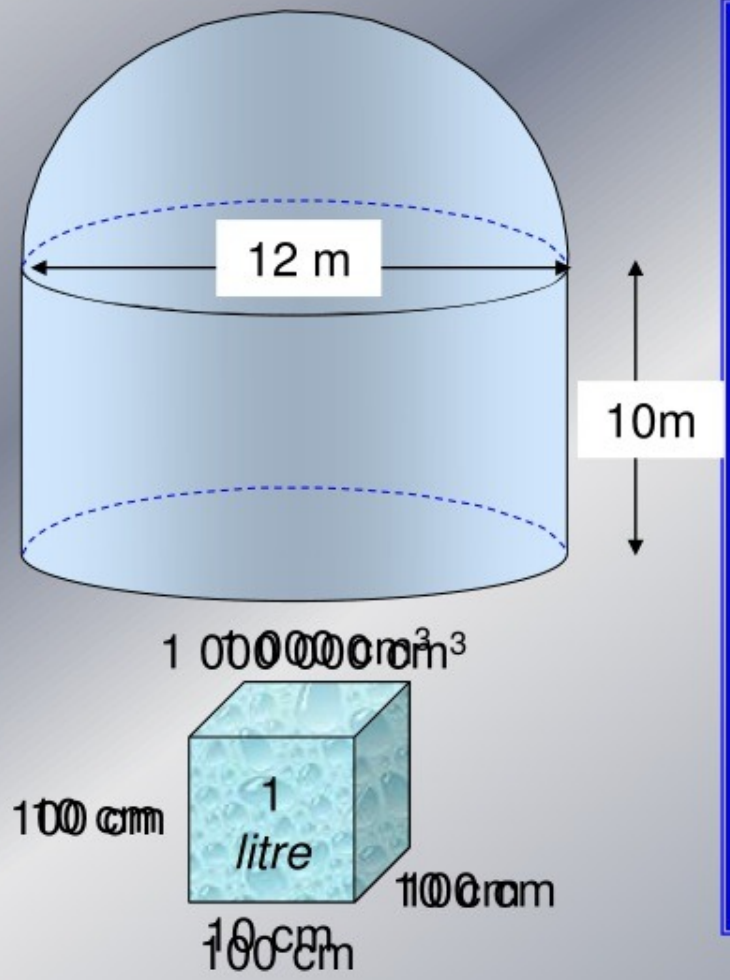
Total volume = $27\pi + 180\pi + 18\pi = 225\pi$ cm^3

$= \underline{710 \text{ cm}^3}$

Question 3

Composite Solids

The diagram below shows a design for a water tank. The water tank consists of a cylinder capped with a hemi-spherical dome. Find the capacity of the water tank. (Give your answer in litres to 3 sig fig).



Capacity of hemi-sphere = $2/3\ \pi r^3$

$= 2/3 \times \pi \times 6^3$

$= 144\pi\ m^3$

Capacity of cylinder = $\pi r^2 h$

$= \pi \times 6^2 \times 10$

$= 360\pi\ m^3$

Total capacity = $144\pi + 360\pi = 504\pi\ m^3$

$= 504\ 000\ 000\pi\ cm^3$

$= 504\ 000\pi$ litres

$= \underline{1\ 580\ 000\ \text{litres}}$ (3 sig fig)

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Composite Solids

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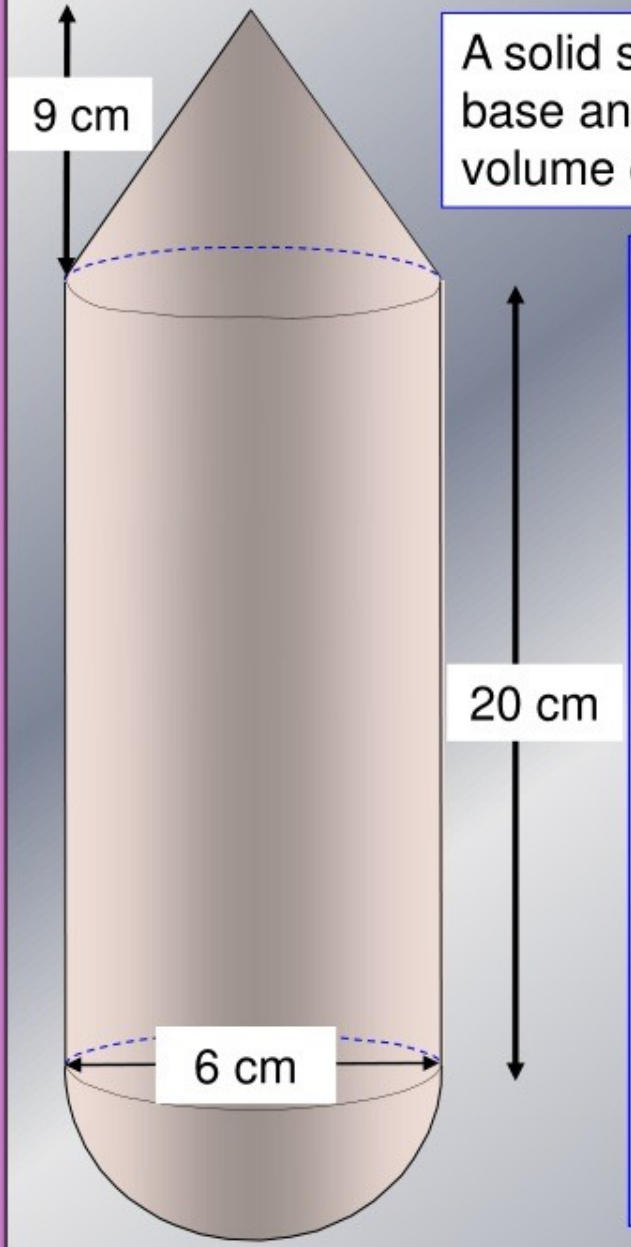

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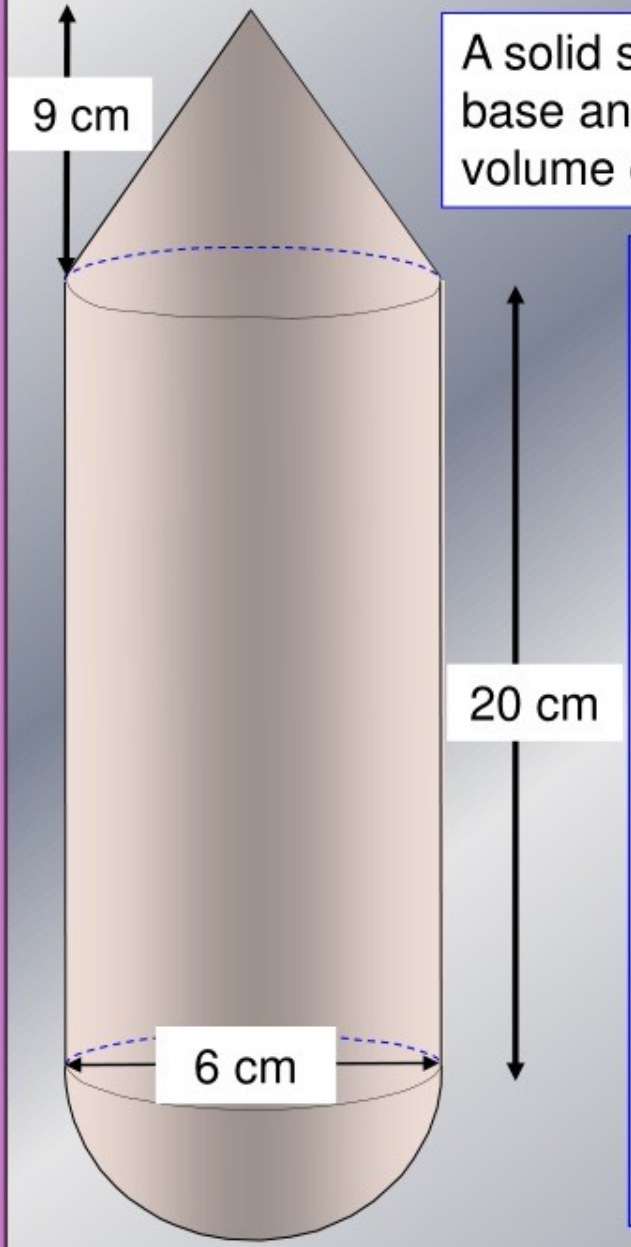

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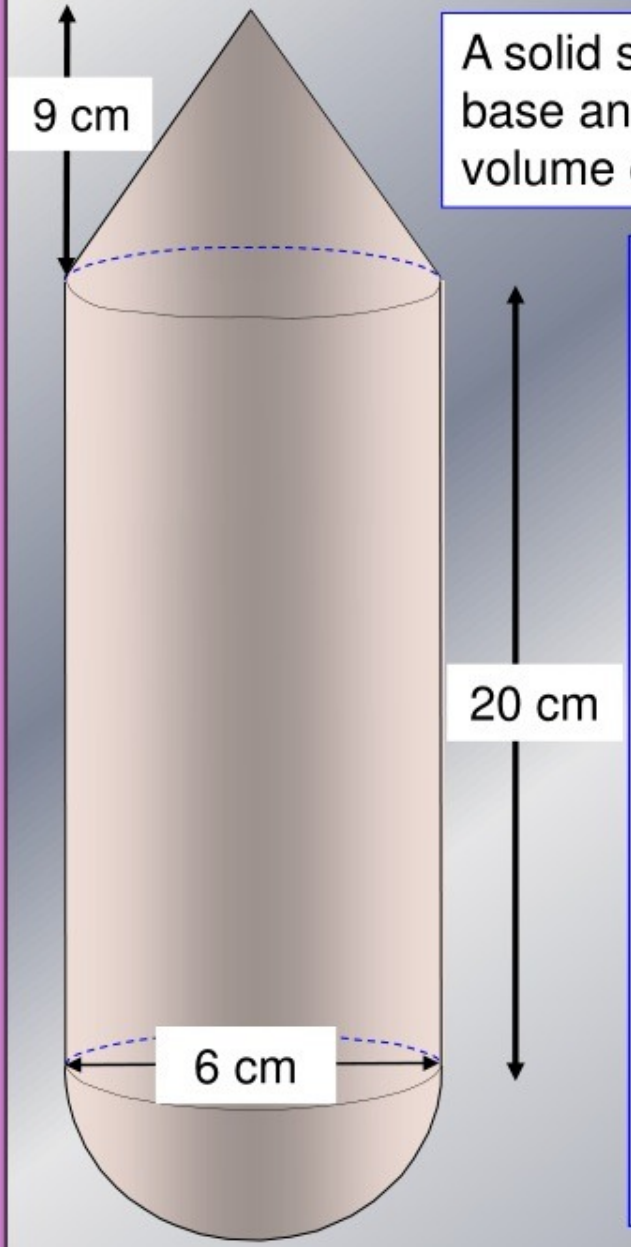

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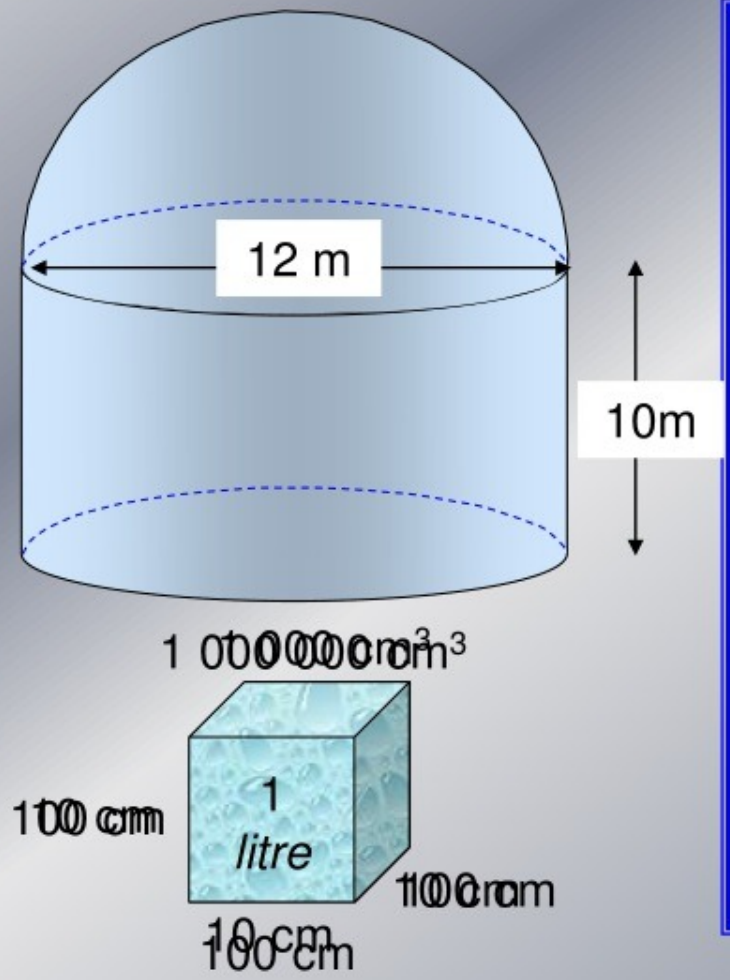

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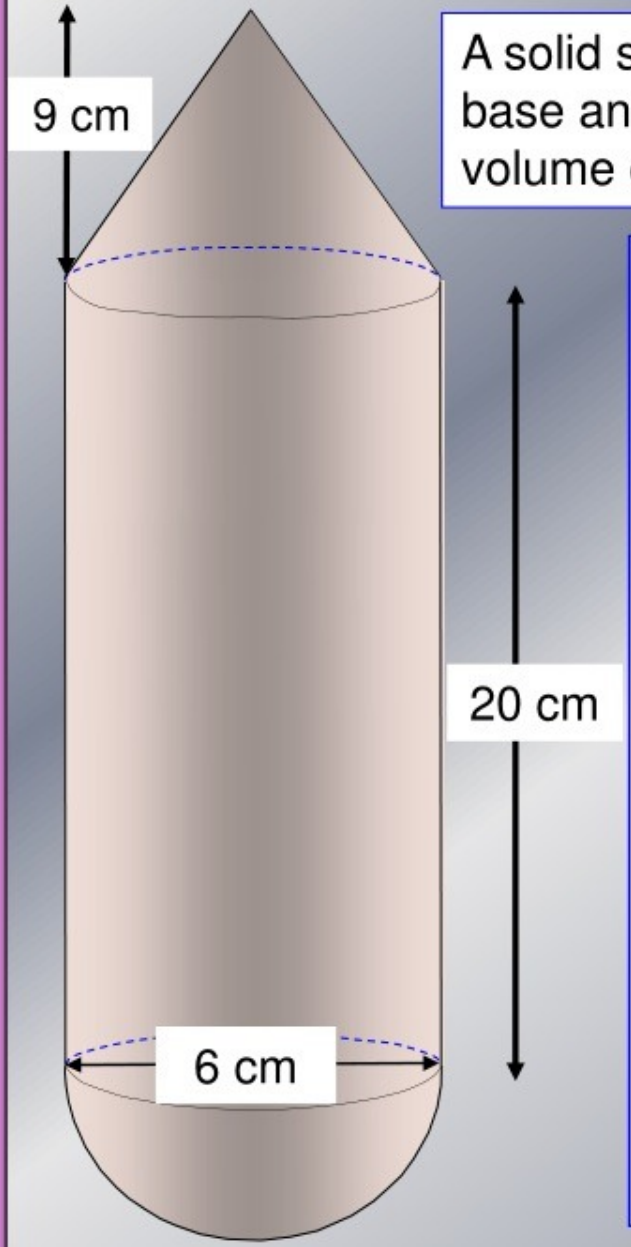

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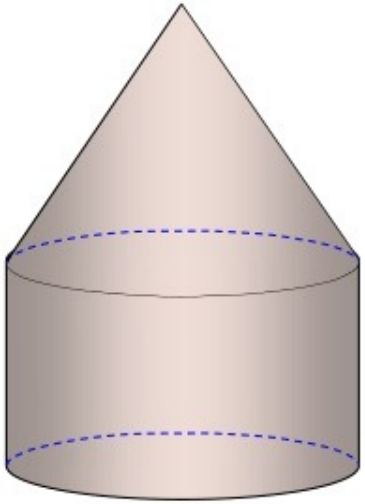
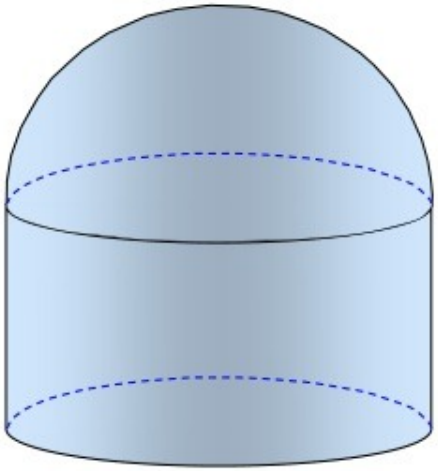
Example Questions

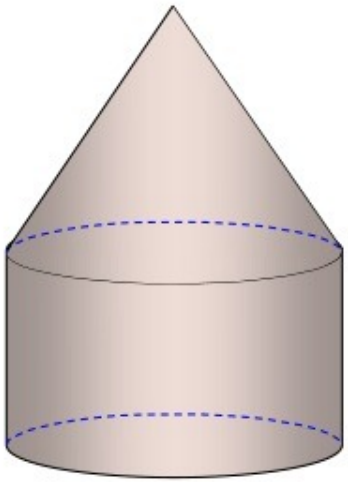
Surface Area

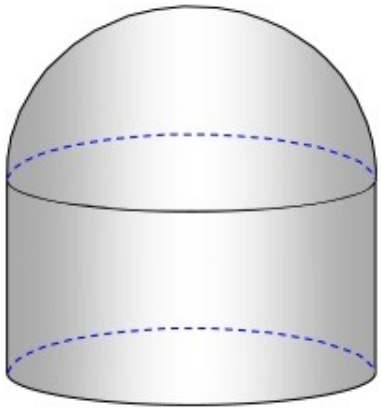


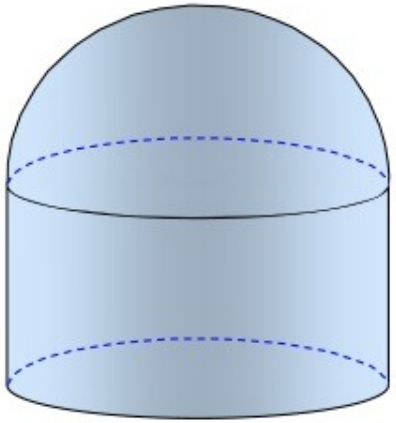


Questions

Volume/Capacity







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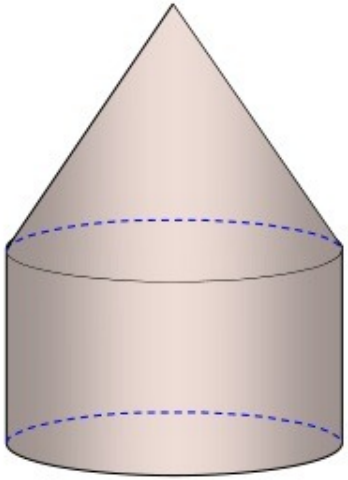

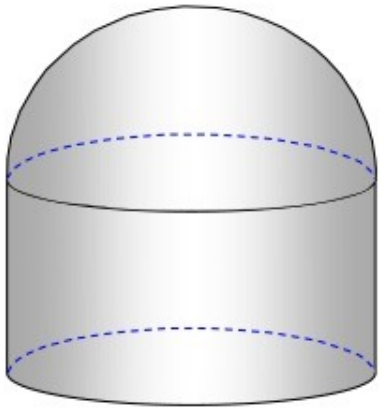

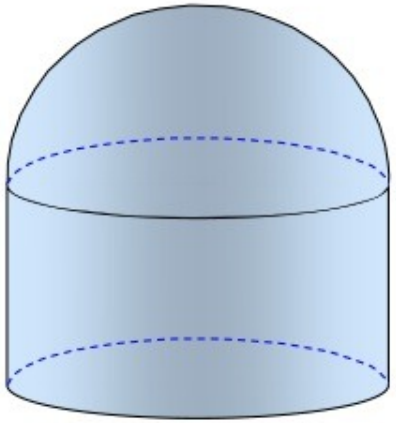

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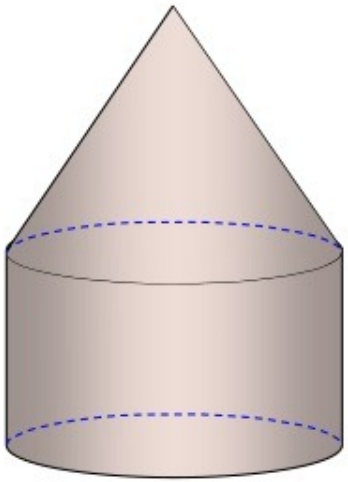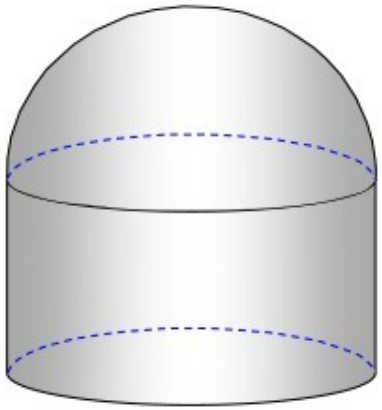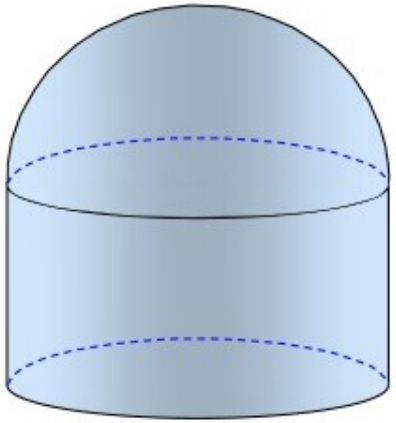
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