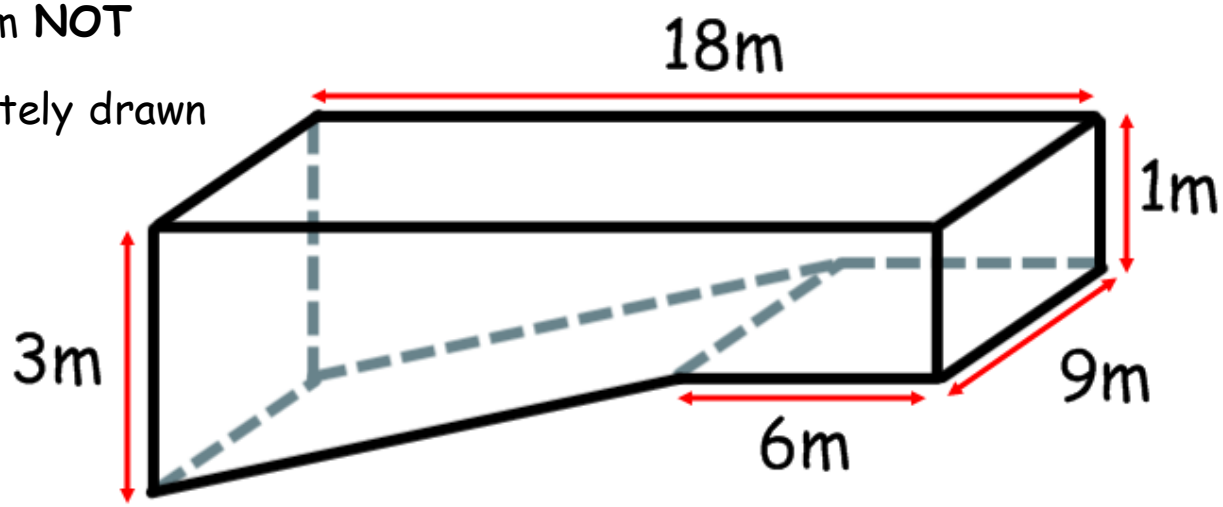
Functional Volume Questions

ACCESS MATHS

1) James has a swimming pool in the shape of a prism.

Diagram **NOT**

Accurately drawn



The swimming pool is empty.
It is filled with water at a constant rate.
It takes 4 hours for the water to be 2 meters deep from the deepest point.
a) How long will it take to completely fill the pool?
Give your answer in hours.
($1m^3$ = 1000litres)
You must show all your working.

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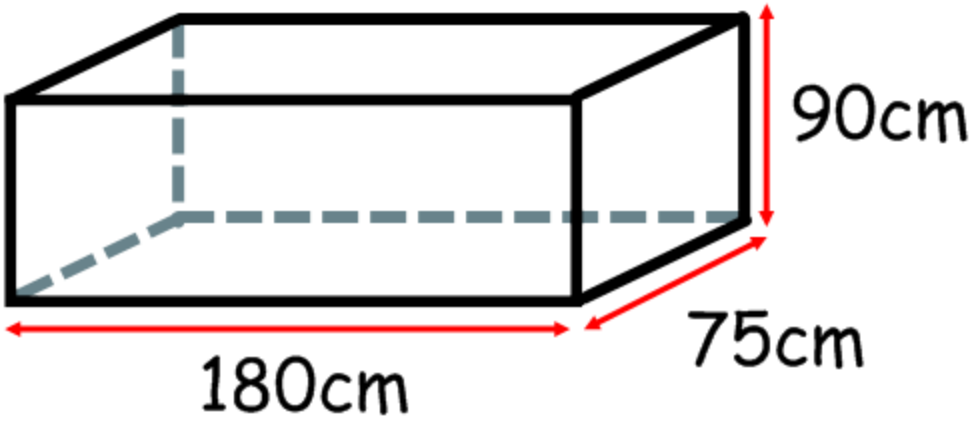
2) Abigail has a fish tank in the shape of a cuboid.

Diagram **NOT**

Accurately drawn



The fish tank is filled with water at a constant rate.

It takes 6.35 seconds to fill 1 gallon.

The fish tank is empty.

a) How long will it take to fill the whole tank?

$1cm^3$ = 0.001 litres

1 gallon = 4.54609 litres

You must show all your working.

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3) Sachyham has built a new structure to store grain.

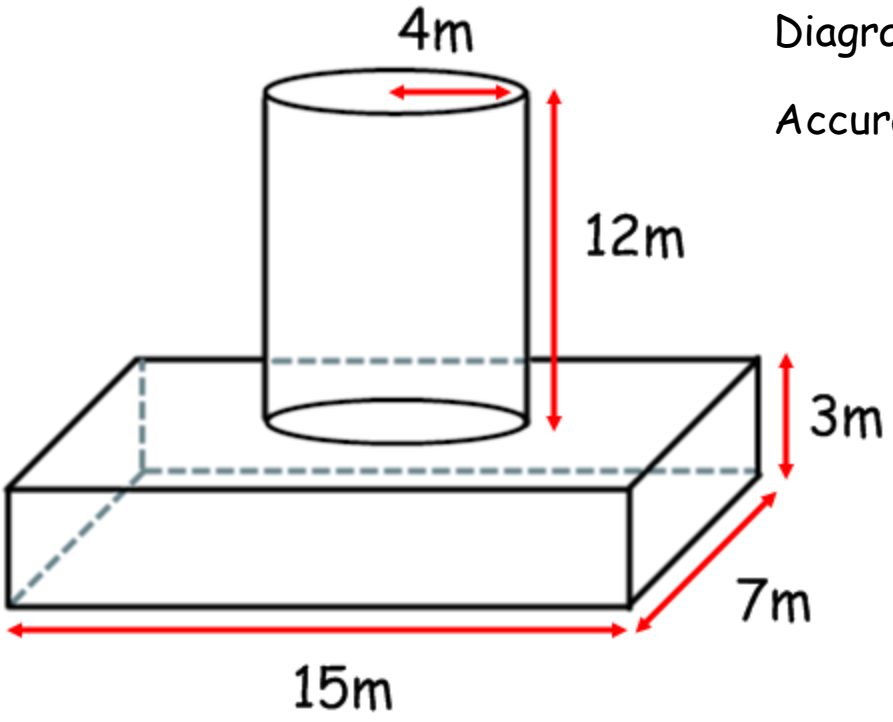

Diagram **NOT**

Accurately drawn

The structure is empty.
The structure fills with grain at a constant rate.
After 3 hours the structure is filled 5 meters above the centre of the base.

a) How long will it take to fill the structure?
Round your answer to the nearest minute.
You must show all your working.

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4) The diagram shows a storage container for flour.

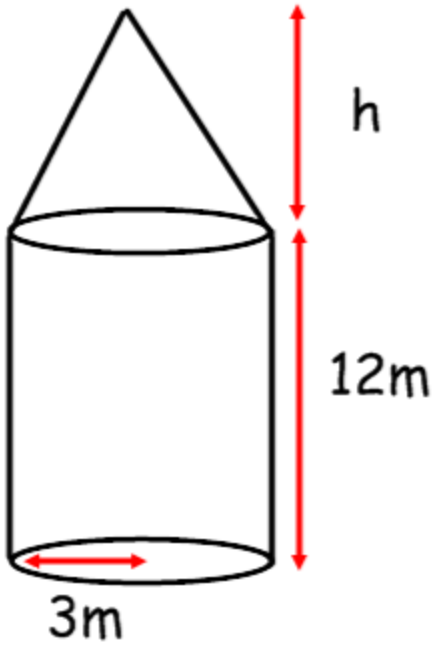

Diagram **NOT**

Accurately drawn

The container is a cone on top of a cylinder.
The cylinder has a radius of 3m and a height of 12m.
The cone has a radius of 3m and a height of hm.

The container is empty.
The container is then filled with flour at a constant rate.

After 3 hours the depth of the flour is 5 meters high.
After 8 hours the container if full of flour.

Work out the value of h.
You must show all your working.

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5) The diagram shows a glass water container.

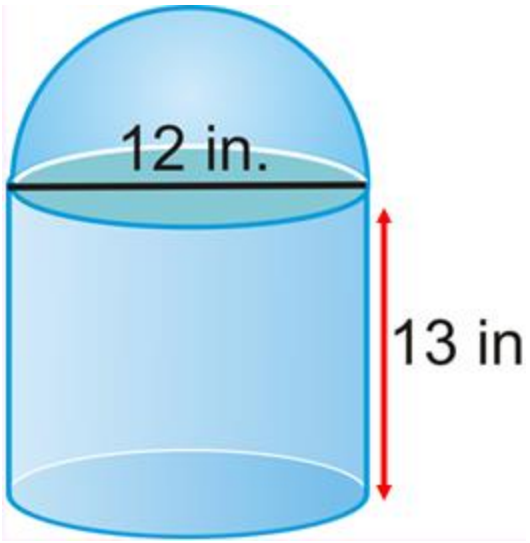

Diagram **NOT**

Accurately drawn

The container is a hemisphere on top of a cylinder.
The cylinder has a diameter of 12 inches and a height of 13 inches.
The hemisphere has a diameter of 12 inches.

The container is empty.
The container is then filled with water at a constant rate.

After 9 minutes the depth of the water is 7 inches high.
Will the container be full after 21 minutes?

Explain your answer.
You must show all your working.

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6) The diagram shows a rocket.

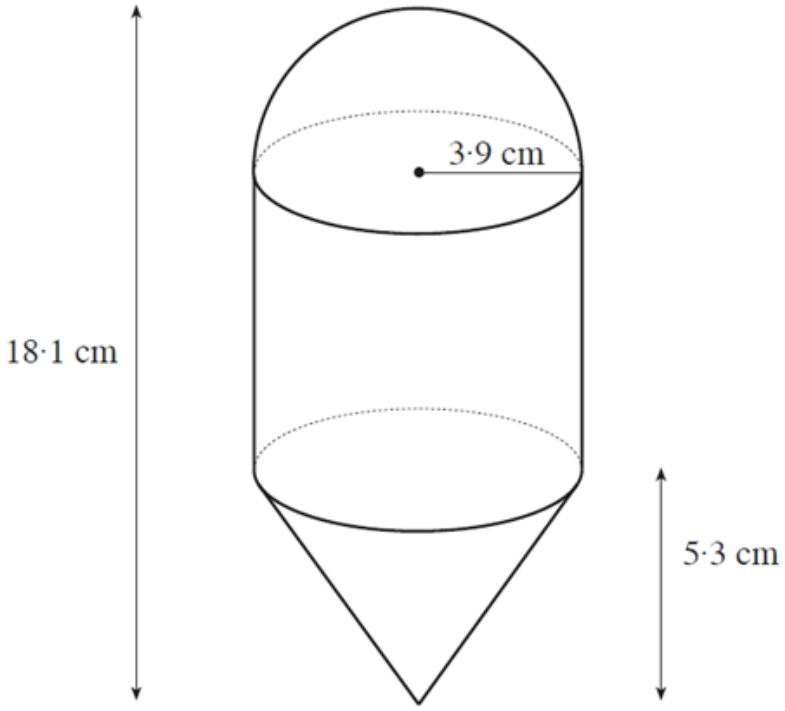

Diagram **NOT**

Accurately drawn

The rocket is a hemisphere on top of a cylinder on top of a cone.
The hemisphere has a radius of 3.9cm.
The cone has a height of 5.3cm.
The whole rocket has a height of 18.1cm.

The container is empty.
The rocket is then filled to the top with fuel at a constant rate.

After 15 minutes the depth of the fuel will be 7.7cm above the vertex of the cone.
How long will it take to fill the whole rocket?
Round your answer to the nearest minute.
You must show all your working.