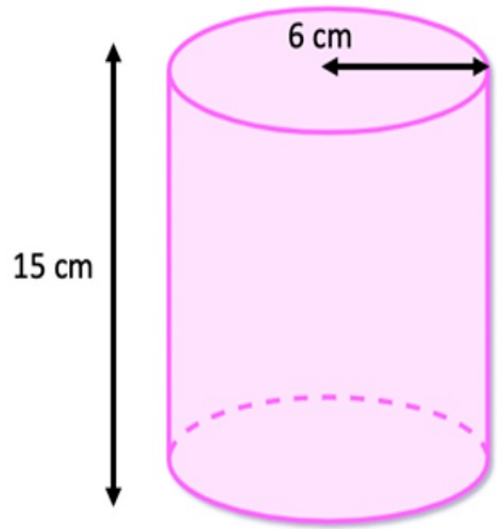
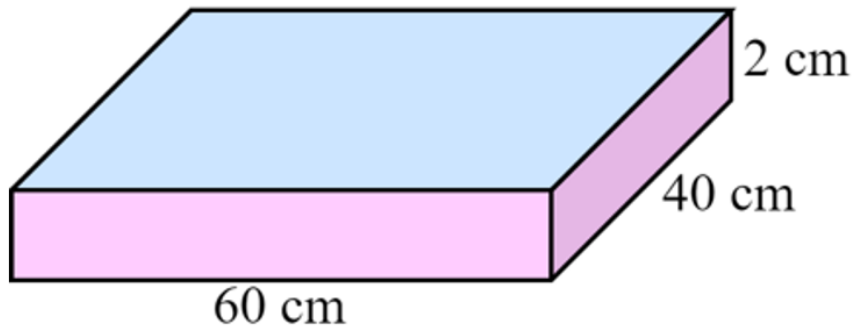
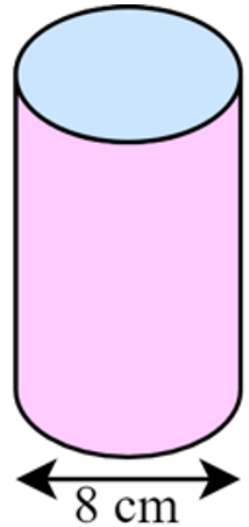
Jenny fills some empty flowerpots completely with compost.



Each flowerpot is in the shape of a cylinder of height 15 cm and radius 6 cm. She has a 15 litre bag of compost. She fills up each flowerpot completely. How many flowerpots can she fill?

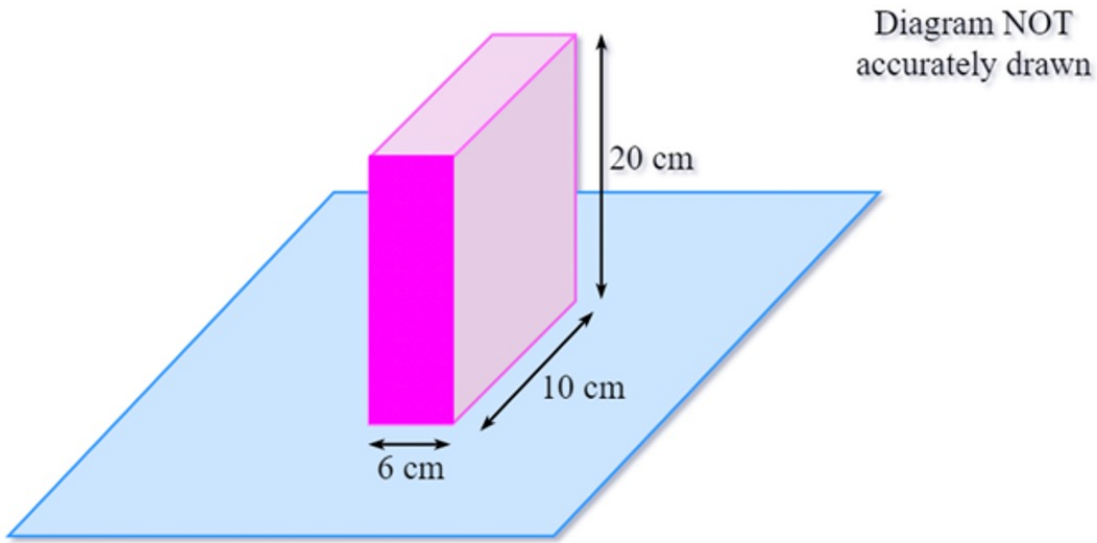
A rectangular tray has length 60 cm, width 40 cm and depth 2 cm. It is full of water.





The water is poured into an empty cylinder of diameter 8 cm. Calculate the depth, in cm, of water in the cylinder. Give your answer to 3 significant figures

Jane has a carton of orange juice. The carton is in the shape of a cuboid. The depth of the orange juice in the carton is 8 cm.



Jane closes the carton
The then turns the carton over so it stands on the dark pink shaded face
Work out the depth, in cm, of the orange juice now

Sumeet has a pond in the shape of a prism

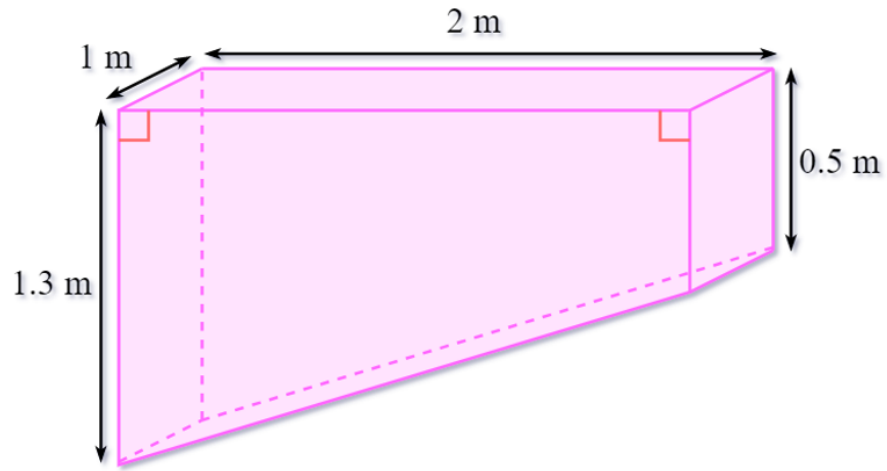


Diagram NOT accurately drawn

The pond is completely of water
Sumeet wants to empty the pond so he can clean it
Sumeet uses a pump to empty the pond
The volume of the water in the pond decreases at a constant rate
The level of the water in the pond goes down by 20 cm in the first 30 minutes
Work out how much more time Sumeet has to wait for the pump to empty the pond completely

The diagram shows a container for grain

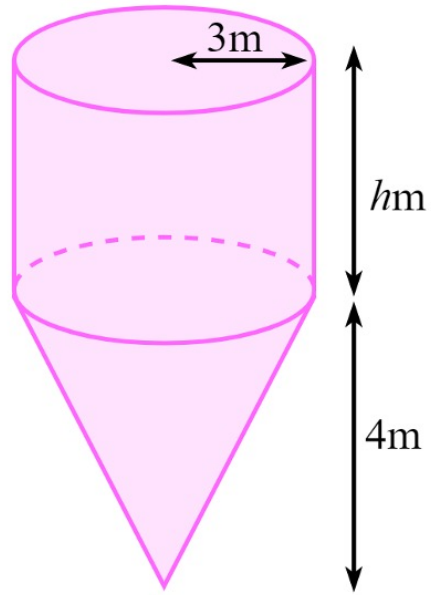
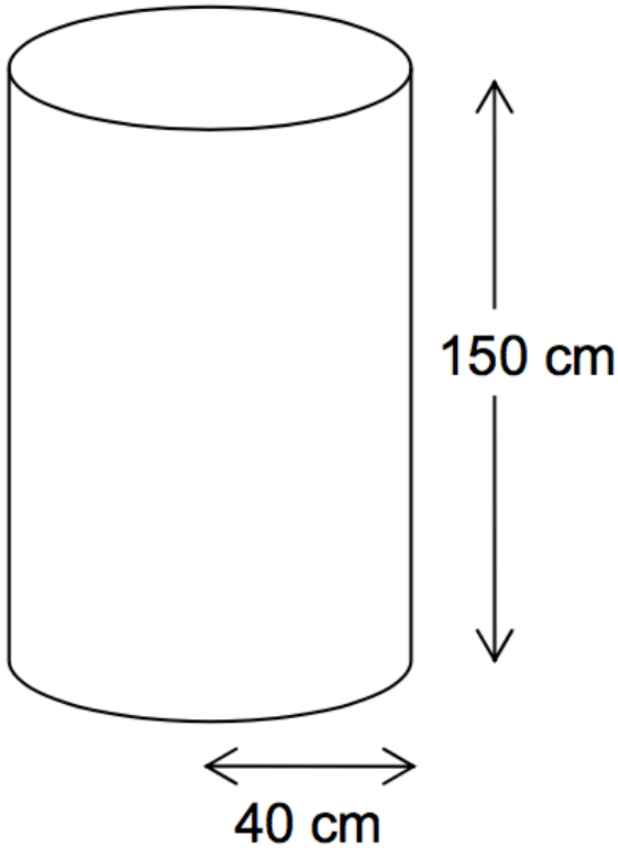


Diagram NOT accurately drawn

The container is a cylinder on top of a cone
The cylinder has a radius of 3 m and a height of h m
The cone has a base radius of 3 m and a vertical height of 4 m
The container is empty
The container is then filled with grain at a constant rate
After 5 hours the depth of the grain is 6 metres above the vertex of the cone
After 9 hours the container is full of grain
Work out the value of h
Give your answer as a fraction in its simplest form

A water tank is a cylinder with radius 40 cm and depth 150 cm



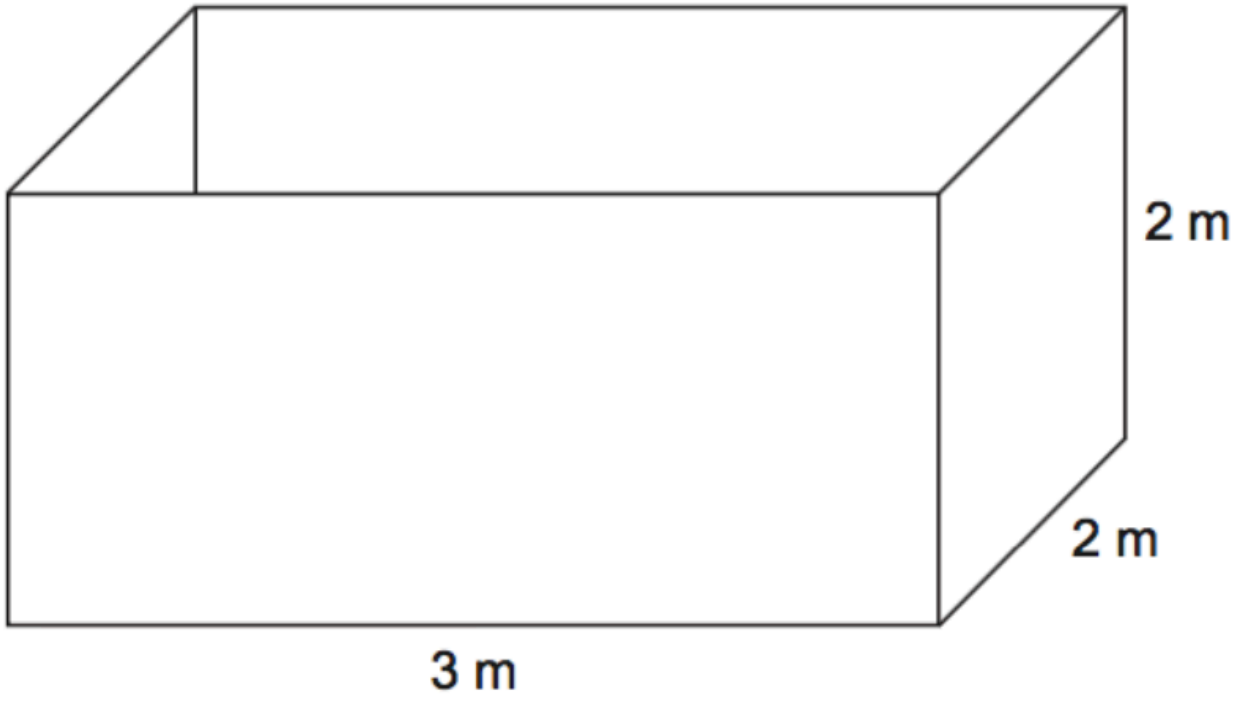
It is filled at the rate of 0.2 litres per second.

1 litre = 1000 cm^3

Does it take longer than 1 hour to fill the tank?

You **must** show your working.

An empty tank is in the shape of a cuboid as shown.



The tank is to be filled with water at 1.25 litres per second.

1 m^3 = 1000 litres

Work out the time taken to fill the tank.
Give your answer in hours and minutes.

Jane makes cheese.

The cheese is in the shape of a cuboid.

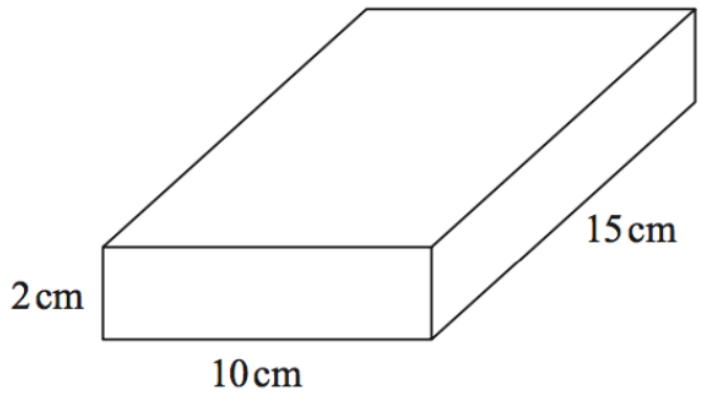


Diagram **NOT** accurately drawn

Jane is going to make a new cheese.

The new cheese will also be in the shape of a cuboid.
The cross section of the cuboid will be a 5 cm by 5 cm square.

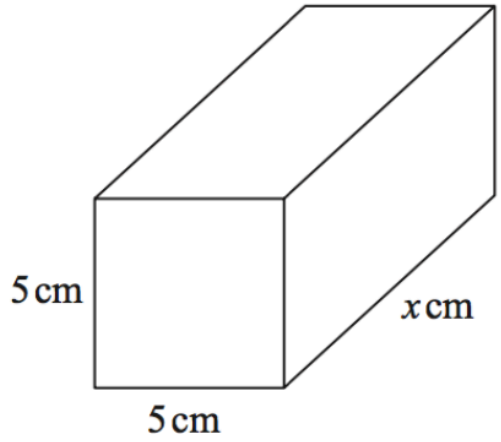


Diagram **NOT** accurately drawn

Jane wants the new cuboid to have the same volume as the 2 cm by 10 cm by 15 cm cuboid.

Work out the value of x.

Here is a plan of Martin's driveway.

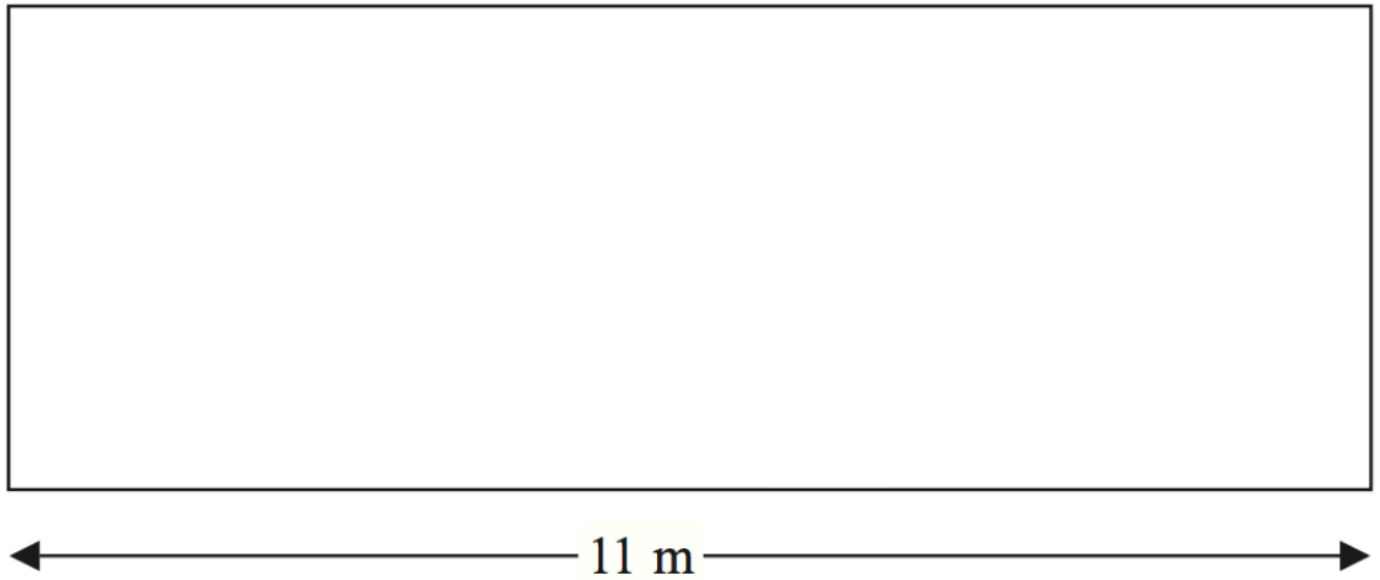


Diagram **NOT** accurately drawn

Martin is going to cover his driveway with gravel.
The gravel will be 6 cm deep.

Gravel is sold in bags.
There are 0.4 m^3 of gravel in each bag.
Each bag of gravel costs £38

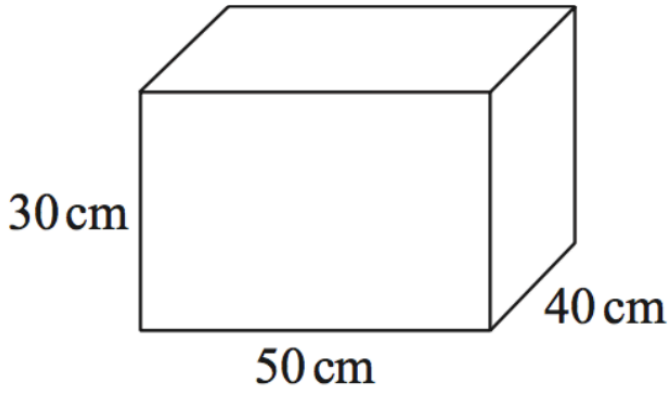
Martin gets a discount of 30% off the cost of the gravel.

Work out the total amount of money Martin pays for the gravel.

The diagram shows a container for oil.
The container is in the shape of a cuboid.
The container is empty.

Diagram **NOT** accurately drawn

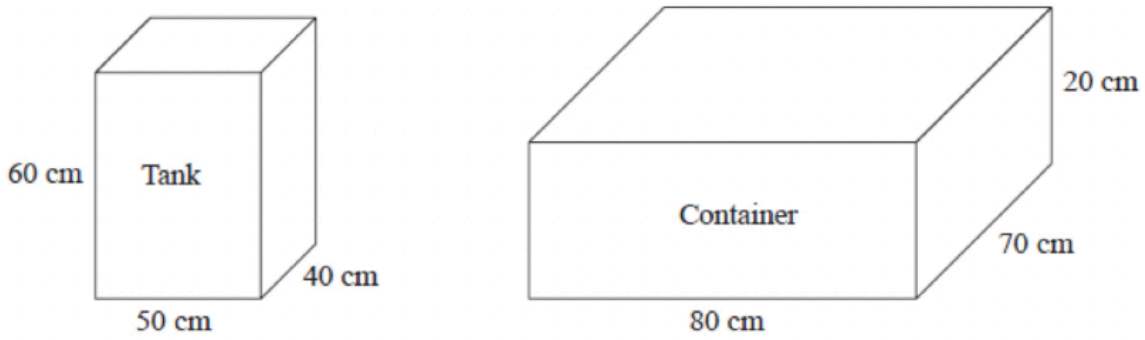
Sally has to fill the container with oil.
A bottle of oil costs £3.50
There are 3000 cm^3 of oil in each bottle.



Sally must **not** spend more than £60 buying the oil.

Can Sally buy enough oil to fill the container?
You must show all your working.

3. The diagram shows a tank in the shape of a cuboid.
It also shows a container in the shape of a cuboid.



The tank is full of oil.
The container is empty

35% of the oil from the tank is spilled.

The rest of the oil from the tank is put into the container.

Work out the height of the oil in the container.
Give your answer to an appropriate degree of accuracy.

The diagram shows a patio in the shape of a rectangle.

Diagram **NOT** accurately drawn

The patio is 3.6 m long and 3 m wide.

Matthew is going to cover the patio with paving slabs.
Each paving slab is a square of side 60 cm.

Matthew buys 32 of the paving slabs.

(a) Does Matthew buy enough paving slabs to cover the patio?
You must show all your working.

.....

(3)

The paving slabs cost £8.63 each.

(b) Work out the total cost of the 32 paving slabs.

Here is a diagram of Jim's garden.

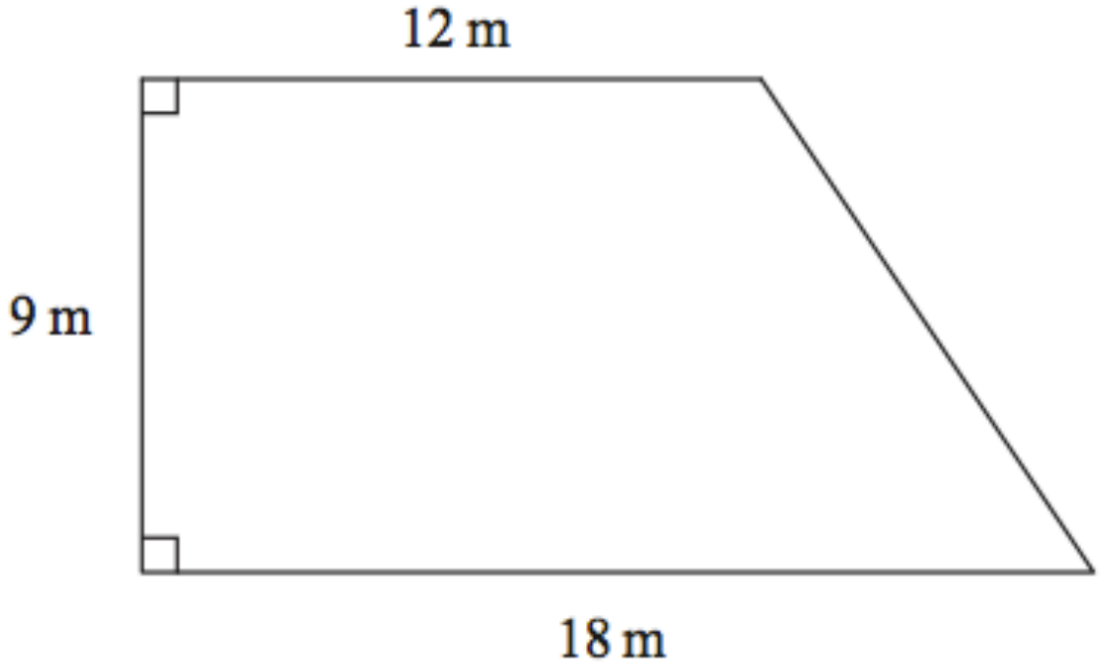


Diagram **NOT** accurately drawn

Jim wants to cover his garden with grass seed to make a lawn.

Grass seed is sold in bags.
There is enough grass seed in each bag to cover 20 m^2 of garden.

Each bag of grass seed costs £4.99

Work out the least cost of putting grass seed on Jim's garden.

The diagram shows the floor plan of Mary's conservatory.

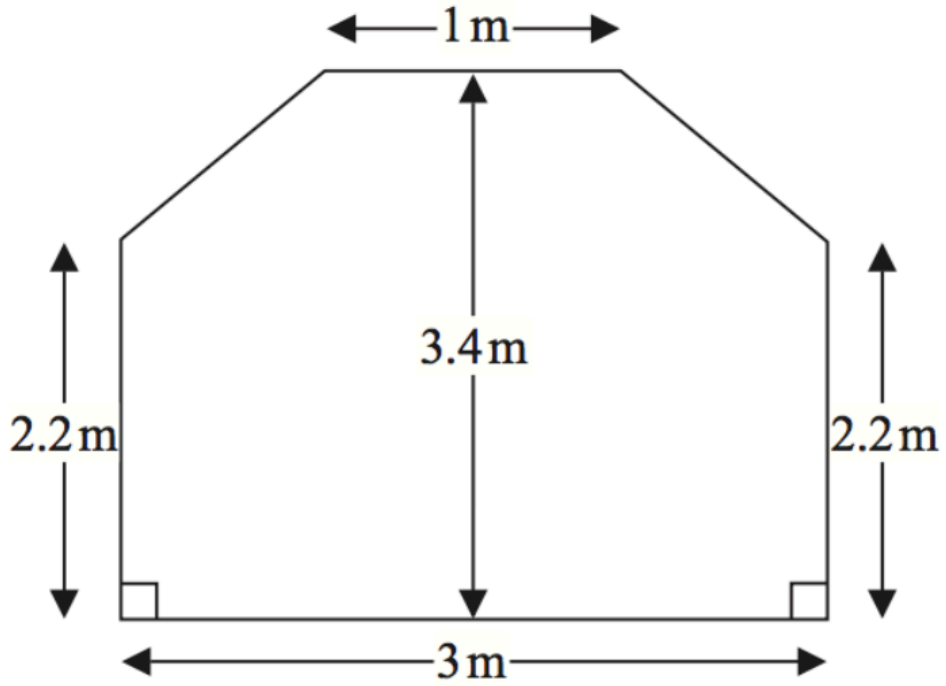


Diagram **NOT** accurately drawn

Mary is going to cover the floor with tiles.

The tiles are sold in packs.
One pack of tiles will cover $2\,m^2$
A pack of tiles normally costs £24.80
Mary gets a discount of 25% off the cost of the tiles.

Mary has £100

Does Mary have enough money to buy all the tiles she needs?
You must show all your working.

A rectangular tray has length 60 cm, width 40 cm and depth 2 cm.
It is full of water.
The water is poured into an empty cylinder of diameter 8 cm.

Calculate the depth, in cm, of water in the cylinder.
Give your answer correct to 3 significant figures.

Soap powder is sold in two sizes of box.

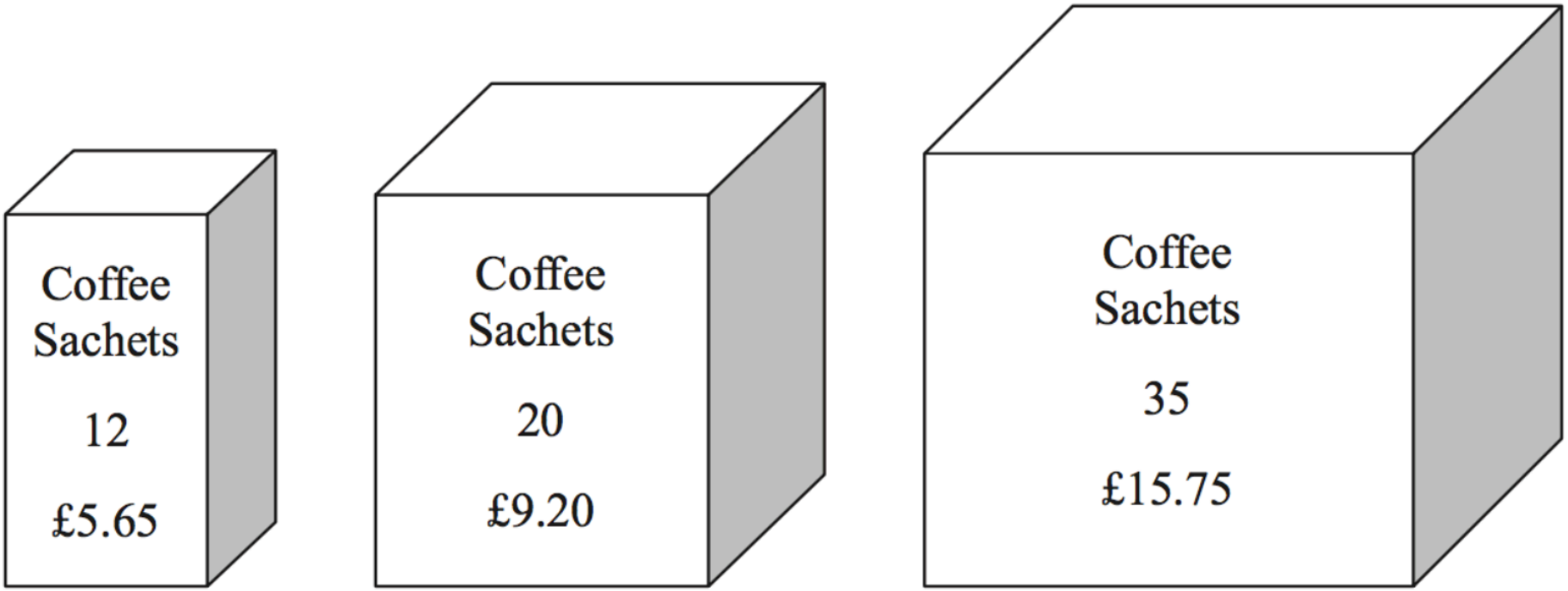
Small box Large box

Which size of box gives the better value for money?

Explain your answer.

You must show all your working.

Coffee sachets are sold in three different sizes of box.



small medium large

A small box has 12 coffee sachets and costs £5.65
A medium box has 20 coffee sachets and costs £9.20
A large box has 35 coffee sachets and costs £15.75

Work out which size of box gives the best value for money.
You must show all your working.

A company makes boxes of cereal.

A box usually contains 450 grams of cereal.

Here are two options for a special offer.

Option A
20% more cereal
Price remains the same

Option B
Usual amount of cereal
15% off the price

Which option is the better value for the customer?

You **must** show your working.

Tom is going to buy 25 plants to make a hedge.

Here is information about the cost of buying the plants.

Kirsty's Plants	**Hedge World**
£2.39 each	Pack of 25 £52.50 plus VAT at 20%

Tom wants to buy the 25 plants as cheaply as possible.

Should Tom buy the plants from Kirsty's Plants or from Hedge World?
You must show all your working.

Henry is thinking about having a water meter.

These are the two ways he can pay for the water he uses.

Water Meter

A charge of £28.20 per year

plus

91.22p for every cubic metre of water used

1 cubic metre = 1000 litres

No Water Meter

A charge of £107 per year

Henry uses an average of 180 litres of water each day.

Henry wants to pay as little as possible for the water he uses.
Should Henry have a water meter?

Railtickets and Cheaptrains are two websites selling train tickets.

Each of the websites adds a credit card charge and a booking fee to the ticket price.

Railtickets

Credit card charge: 2.25% of ticket price

Booking fee: 80 pence

Cheaptrains

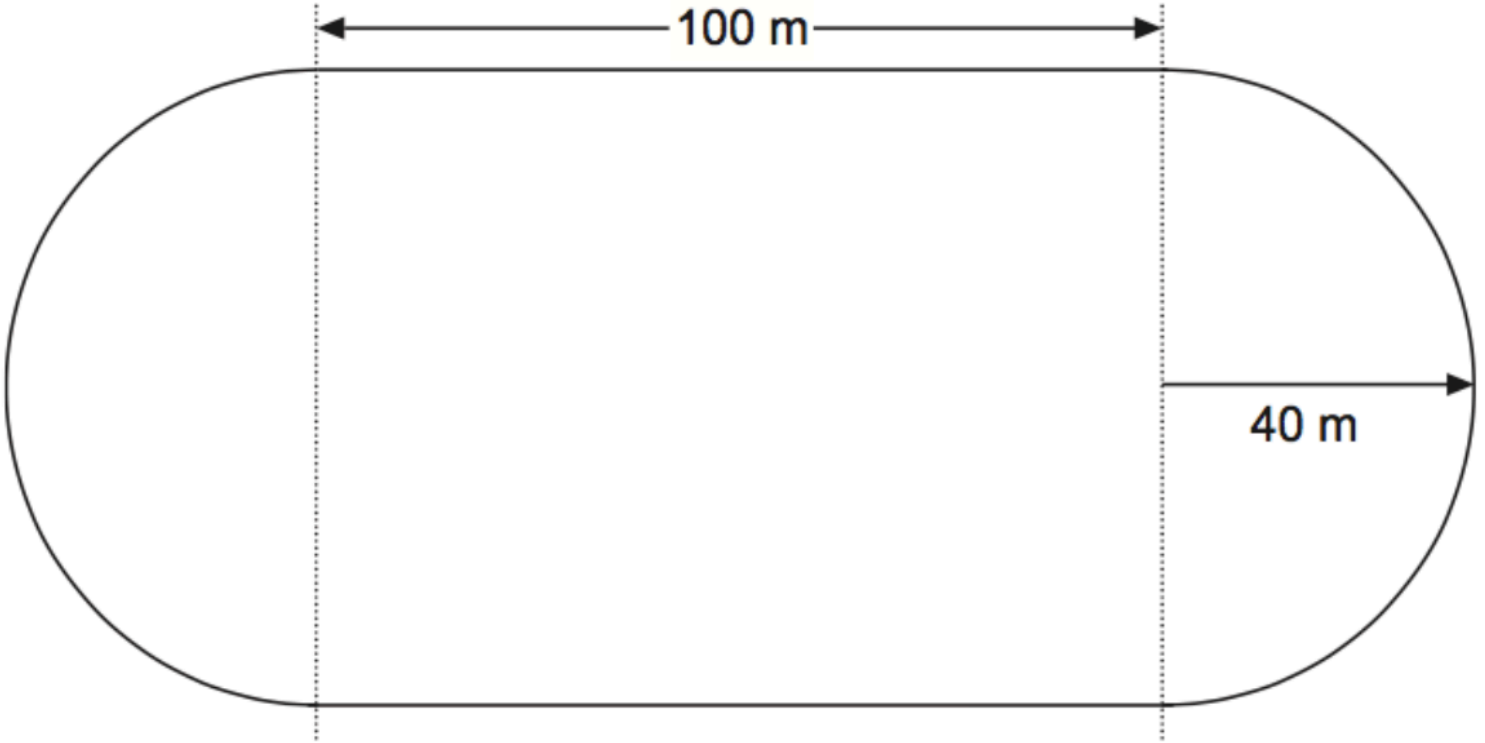
Credit card charge: 1.5% of ticket price

Booking fee: £1.90

Nadia wants to buy a train ticket.
The ticket price is £60 on each website.
Nadia will pay by credit card.

Will it be cheaper for Nadia to buy the train ticket from Railtickets or from Cheaptrains?

A cycle track has two identical semi-circular ends and two straight sides as shown.



Not drawn accurately

A cyclist completes one lap.

Her average speed is 18 m/s
Her target time to complete one lap is 30 seconds.

Does she beat her target?
You **must** show your working.

Tame Valley is a company that makes yoghurt.

A machine fills trays of 20 pots with yoghurt.
In one hour, the machine fills a total of 15 000 pots.

Work out how many seconds the machine takes to fill each tray of 20 pots.

Margaret has some goats.
The goats produce an average total of 21.7 litres of milk per day for 280 days.
Margaret sells the milk in $\frac{1}{2}$ litre bottles.

Work out an estimate for the total number of bottles that Margaret will be able to fill with the milk.

You must show clearly how you got your estimate.

Milk is sold in $\frac{1}{2}$ pint bottles, in 1 pint bottles and in 2 pint bottles.

One weekend a shop sold 100 bottles of milk.

46 of the bottles were sold on Sunday.
15 of the bottles sold on Sunday were 2 pint bottles.

31 of the bottles sold on Saturday were $\frac{1}{2}$ pint bottles.

22 of the bottles sold were 2 pint bottles.
30 of the bottles sold were 1 pint bottles.

How many 1 pint bottles were sold on Sunday?

Liquid A has a density of 0.7 g/cm^3.
Liquid B has a density of 1.6 g/cm^3.

140 g of liquid A and 128 g of liquid B are mixed to make liquid C.

Work out the density of liquid C.

Liquid **A** has a density of 1.42 g/cm^3

7 cm^3 of liquid **A** is mixed with 125 cm^3 of liquid **B** to make liquid **C**.

Liquid **C** has a density of 1.05 g/cm^3

Find the density of liquid **B**.
Give your answer correct to 2 decimal places.