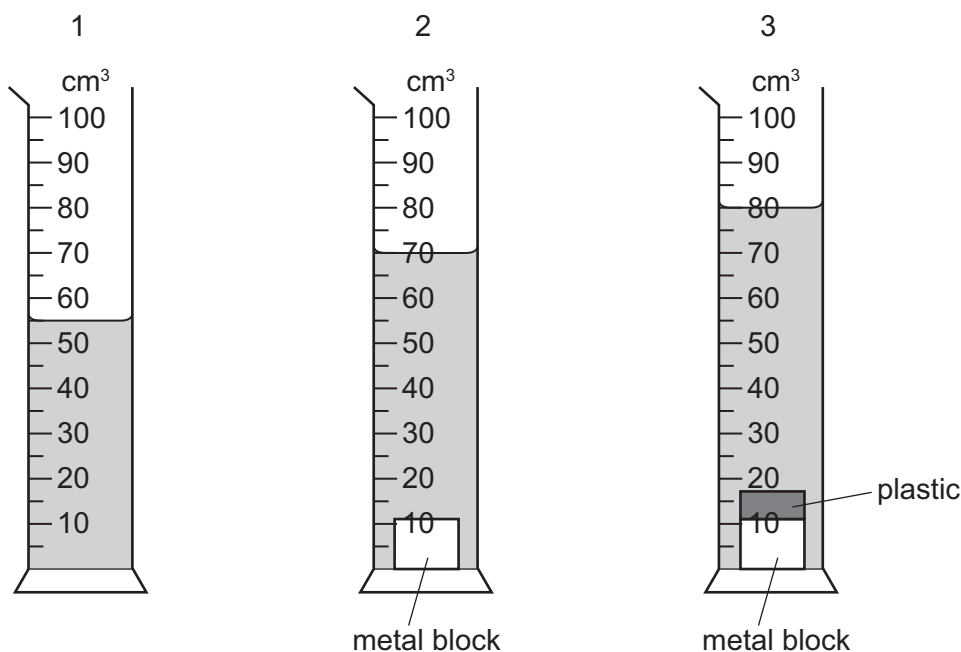


- 1 A measuring cylinder contains some water. A small metal block is slowly lowered into the water and is then removed.

Finally a piece of plastic is attached to the metal block and the block is again slowly lowered into the water.

The diagrams show the measuring cylinder at each stage of this process.



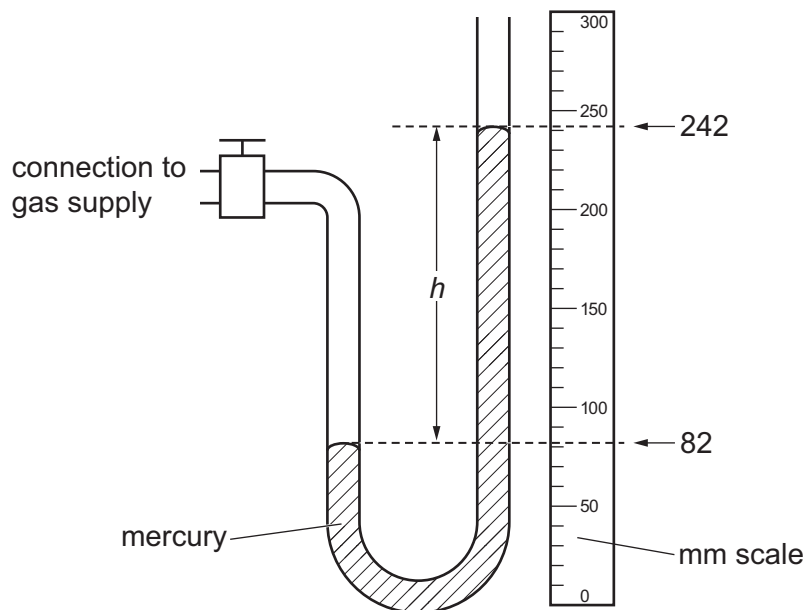
What is the volume of the piece of plastic?

- A** 10 cm^3 **B** 25 cm^3 **C** 70 cm^3 **D** 80 cm^3

[1]

[Total: 1]

- 2 A device for measuring gas pressure is connected to a gas supply as shown in the diagram.



- (a) Determine the difference h between the mercury levels shown in the diagram.

$h = \dots\dots\dots$ mm [2]

- (b) The atmospheric pressure is 760 mm of mercury.

Determine the pressure of the gas supply.

pressure of gas supply = $\dots\dots\dots$ mm of mercury [1]

[Total: 3]

- 3 A student uses a digital stop-watch to measure the time for a car to travel 100 m.

The diagram shows the time reading on the stop-watch.

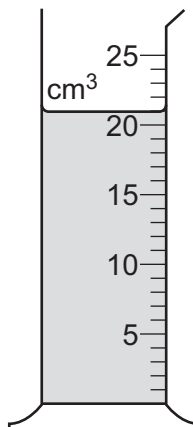


Using the information in the diagram, state the time taken to travel 100 m.

time to travel 100 m = s [1]

[Total: 1]

- 4 The diagram shows a measuring cylinder containing some water.



- (a) State the volume of the water in the measuring cylinder.

volume = cm³ [1]

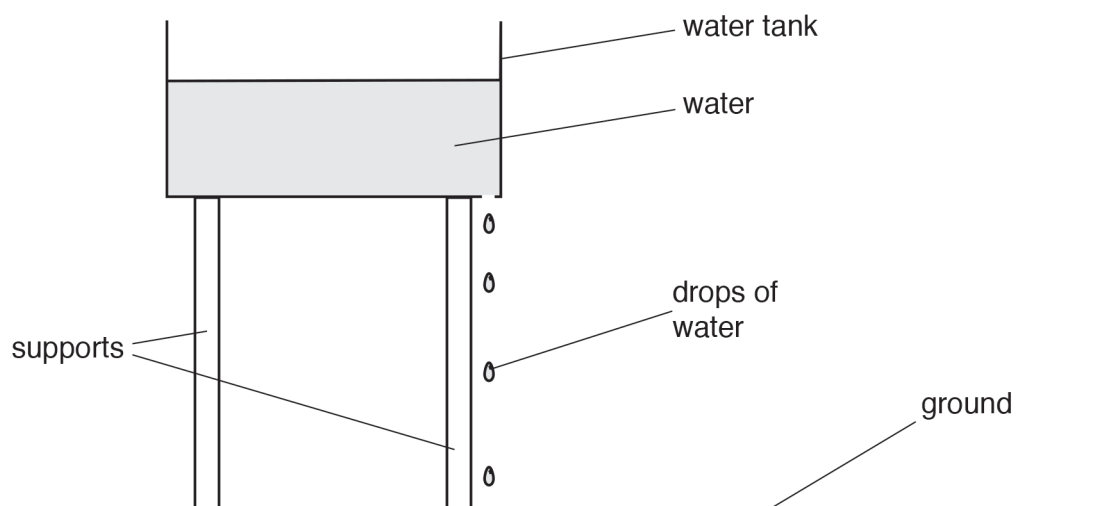
- (b) A student adds 20 drops of water to the water that is in the measuring cylinder in the diagram. The new volume of water in the measuring cylinder is 25 cm^3 .

Calculate the average volume of one drop of water.

average volume of one drop = cm^3 [4]

[Total: 5]

- 5 The diagram shows a water tank that is leaking. Drops of water fall from the tank at a constant rate.



(NOT to scale)

A student uses a stopwatch to determine the time between two drops hitting the ground.

He sets the stopwatch to zero. He starts the stopwatch when the first drop hits the ground.

He stops the stopwatch after a further 30 drops have hit the ground.

The reading on the stopwatch is recorded and shown in the diagram.



- (a) State the time taken for 30 drops to hit the ground.

time = s [1]

- (b) Calculate the average time between two drops hitting the ground.

time = s [2]

- (c) Explain why the student measures the time for 30 drops to hit the ground instead of measuring the time for one drop to hit the ground.

.....

..... [1]

[Total: 4]

- 6 A student is measuring the time period (the time for one complete oscillation) of a pendulum.

The student uses a stopwatch to measure the time taken for 50 periods of a pendulum.
The diagram shows the time taken on the stopwatch.

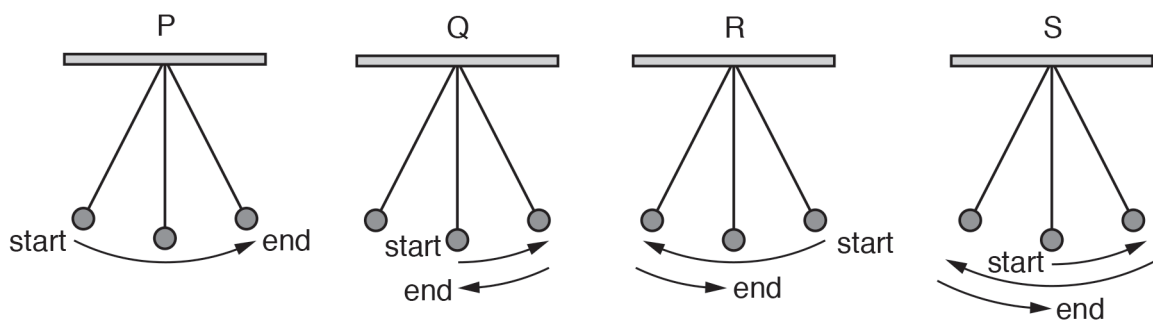


Calculate the time for one period of the pendulum. Give your answer to 3 significant figures.

time for one period = s [3]

[Total: 3]

- 7 Four students P, Q, R and S each attempt to measure the time period (the time for one complete oscillation) of a pendulum. The arrows in the diagram show the movements of the pendulum that each student times.



State the student who has chosen the correct movement for one period of a pendulum.

student

[1]

[Total: 1]

- 8 A device has a light-emitting diode (LED) that flashes briefly at regular intervals.

Describe how to determine accurately the average time for each interval, using a stopwatch.

.....

.....

.....

.....

.....

.....

[4]

[Total: 4]

- 9 A student uses a stopwatch in a timing experiment.

The diagram shows the stopwatch readings.

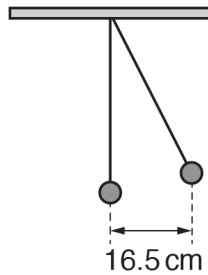


Calculate the time interval between the two readings.

time interval = s [2]

[Total: 2]

- 10 A student measures the displacement of a pendulum bob from its rest position. The displacement is 16.5 cm, as shown in the diagram.

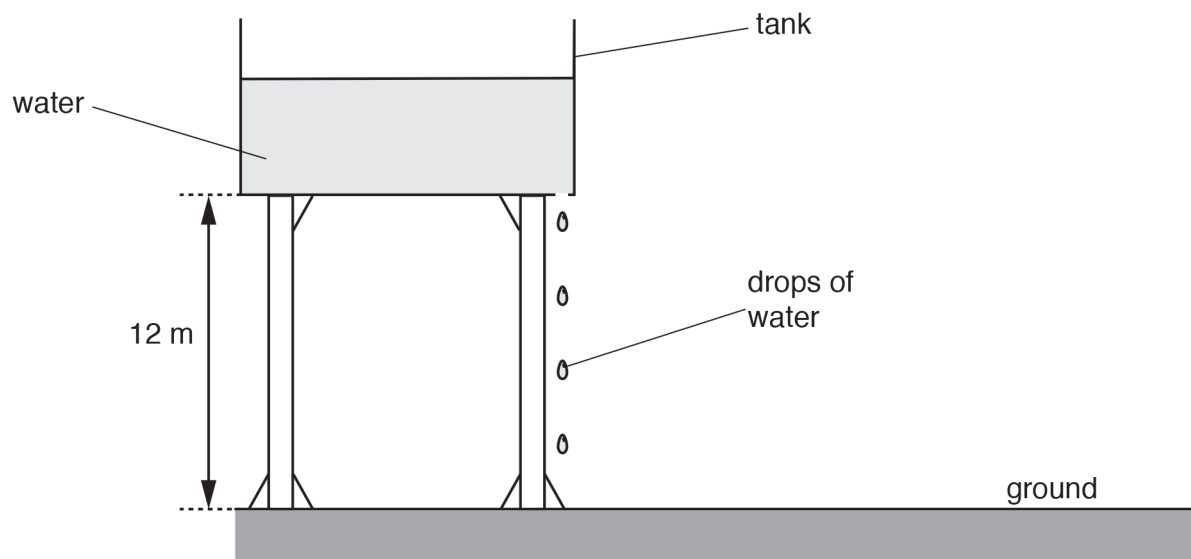


State the displacement in millimetres.

displacement = mm [1]

[Total: 1]

- 11 The diagram shows a large tank containing water. The tank leaks. Drops of water fall from the tank. The drops hit the ground at a regular rate.



- (a) A student measures the time interval between two drops of water hitting the ground. She uses a stopwatch and repeats the procedure three times. The diagram shows each stopwatch reading.



time = s time = s time = s

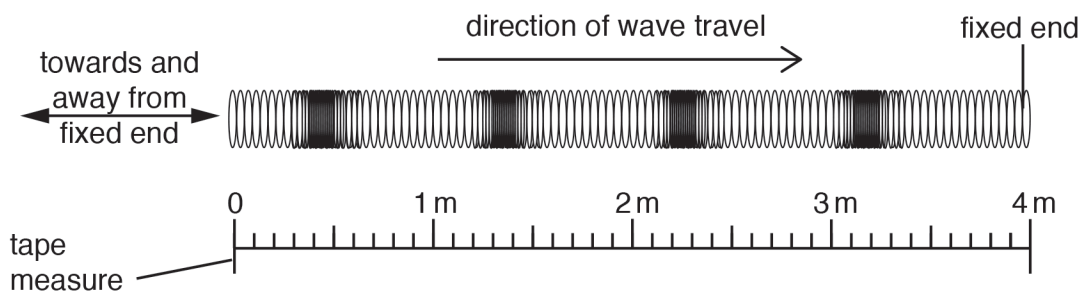
On the line below each stopwatch, state the time readings shown, in seconds. [1]

- (b) Calculate the average time interval between two drops of water hitting the ground.

average time = s [2]

[Total: 3]

- 12 A long spring is fixed at one end, as shown in the diagram. The spring is moved towards and away from the fixed end, repeatedly. The compressions and rarefactions on the spring at a particular time can be seen.



- (a) State the type of wave in the spring.

..... [1]

(b) State one other example of this type of wave.

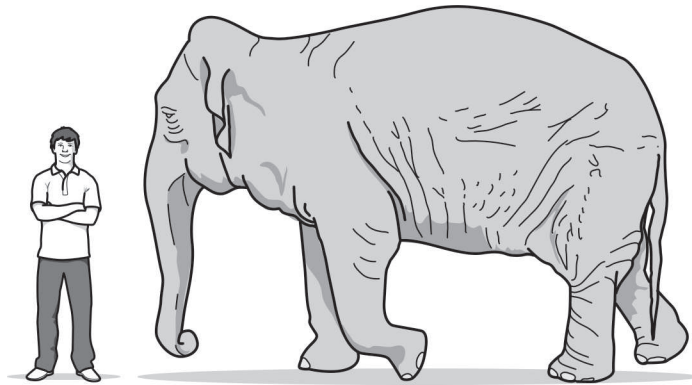
..... [1]

(c) Use the scale in the diagram to determine the wavelength of the wave in the spring.

wavelength = cm [1]

[Total: 3]

13 A student is studying elephants. The diagram shows an elephant.



(a) The student measures the elephant and records the values, as shown in the table.

Complete the table by adding a suitable unit for each measurement. Choose the units from those shown in the box.

m^2	kg	cm	mm^2	g	m	cm^2	mg	mm
--------------	----	----	---------------	---	---	---------------	----	----

measurements	value	unit
mass of elephant	4000	
height of elephant	3.0	
average area of an elephant's foot	0.125	

[2]

(b) Using information from the table in (a):

- (i) calculate the weight of the elephant

weight = N [3]

- (ii) calculate the pressure the elephant exerts on the ground when it is standing on four feet. Include a unit.

pressure = [4]

[Total: 9]