O Level · Cambridge (CIE) · Physics

19 mins 19 questions

Multiple Choice Questions

1.1 Physical Quantities & Measurement Techniques

Measurement / Scalars & Vectors / Calculating with Vectors

Easy (5 questions)	/5
Medium (9 questions)	/9
Hard (5 questions)	/5
Total Marks	**/19**

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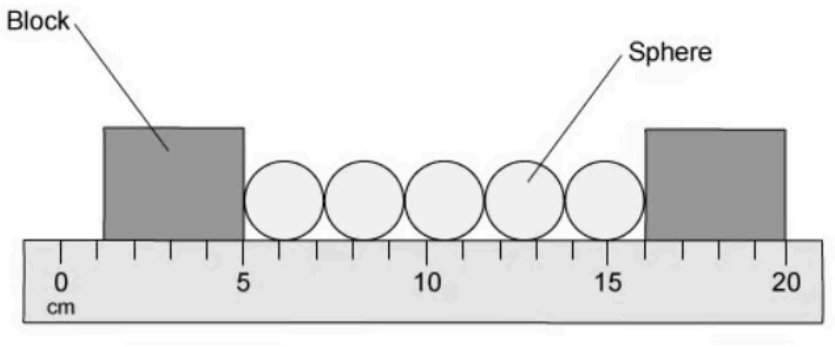
Easy Questions

1 Five identical spheres are placed between two blocks in order to measure their diameter.



What is the diameter of a single sphere?

A. 2.2 cm

B. 2.0 cm

C. 2.1 cm

D. 2.3 cm

(1 mark)

2 A student wants to take a particularly accurate measurement of the volume of liquid in a measuring cylinder.

Which of the following procedures would make her measurement **less** accurate?

A. Putting her eyes level with the height of the measurement to be taken.

B. Reading the liquid level from the bottom of the meniscus.

C. Using the largest measuring cylinder she could find.

D. Using a set-square to make sure the cylinder is perfectly vertical.

(1 mark)

3 A student is timing the rate of cooling of a beaker of water. On a repeat run of the investigation, the student forgets to zero the stopwatch.

The readings on the stopwatch at the start time and the end time are shown in Fig. 1.1

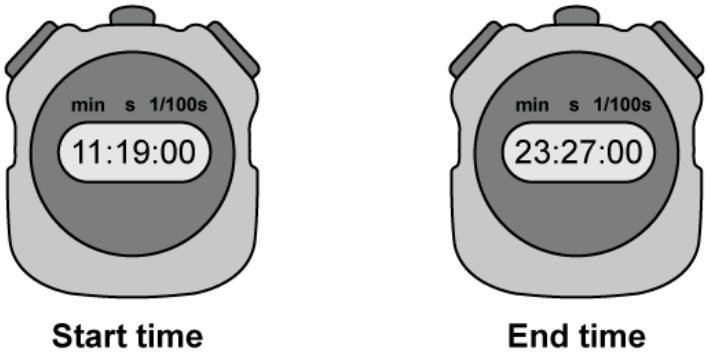


Fig. 1.1

Calculate how long it took the beaker to cool.

A. 11 minutes

B. 11 minutes and 8 seconds

C. 12 minutes

D. 12 minutes and 8 seconds

(1 mark)

4 Identify the physical quantity that is **not** scalar.

A. speed

B. time

C. weight

D. energy

(1 mark)

5 Identify the physical quantity that is scalar.

A. weight

B. distance

C. velocity

D. acceleration

(1 mark)

Medium Questions

1 I wish to roast a chicken for Sunday lunch. The chicken requires 1 hour and 20 minutes in the oven to be properly cooked.

The oven must be switched on 10 minutes before any food is put in, in order to pre-heat, and reach the correct temperature for cooking.

I wish the chicken to be ready at 4:30pm. At what time must I switch the oven on?

A. 2:10pm

B. 3:10pm

C. 2:00pm

D. 3:00pm

(1 mark)

2 A particularly diligent student wants to measure the volume of some liquid for an experiment. She has two measuring cylinders available, a large 250 ml one and a small 50 ml one. The liquid will fit into either of the two measuring cylinders.

As expected, the liquid forms a meniscus where it touches the sides of either measuring cylinder.

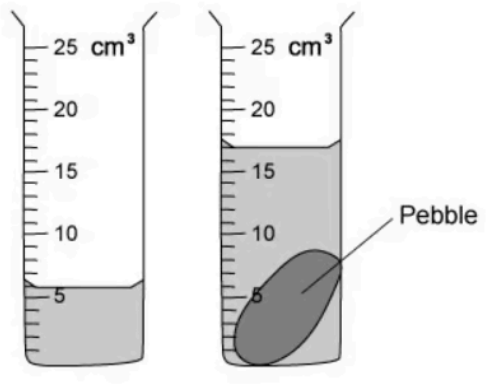
Which cylinder should the student use to get the most accurate result, and from where should she measure the liquid level?

	Measuring cylinder	Reading taken from
A	large	Top of meniscus
B	large	Bottom of meniscus
C	small	Top of meniscus
D	small	Bottom of meniscus

(1 mark)

3 A geologist wants to measure the volume of a particularly interesting pebble she has found in a river.

She uses the apparatus shown below.



What is the volume of the pebble?

A. 11 cm^3

B. 23 cm^3

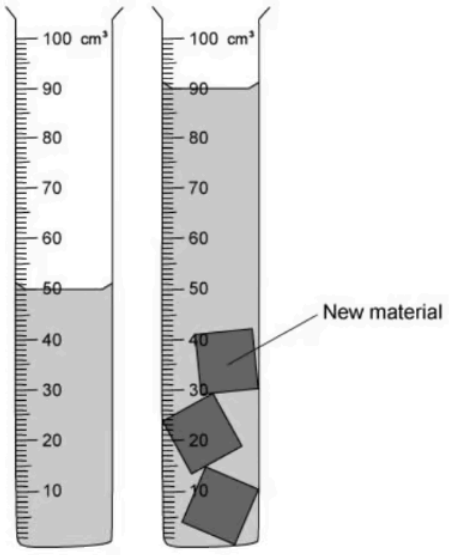
C. 6 cm^3

D. 17 cm^3

(1 mark)

4 A scientist is trying to determine the volume of three identical pieces of a new material. She places them in a measuring cylinder, as shown in the diagram.

The first cylinder shows the level of water in the measuring cylinder before the pieces are added, and the second cylinder shows the measuring cylinder with the pieces of the new material inside.



What is the volume of each piece of the new material?

A. 30.0 cm^3

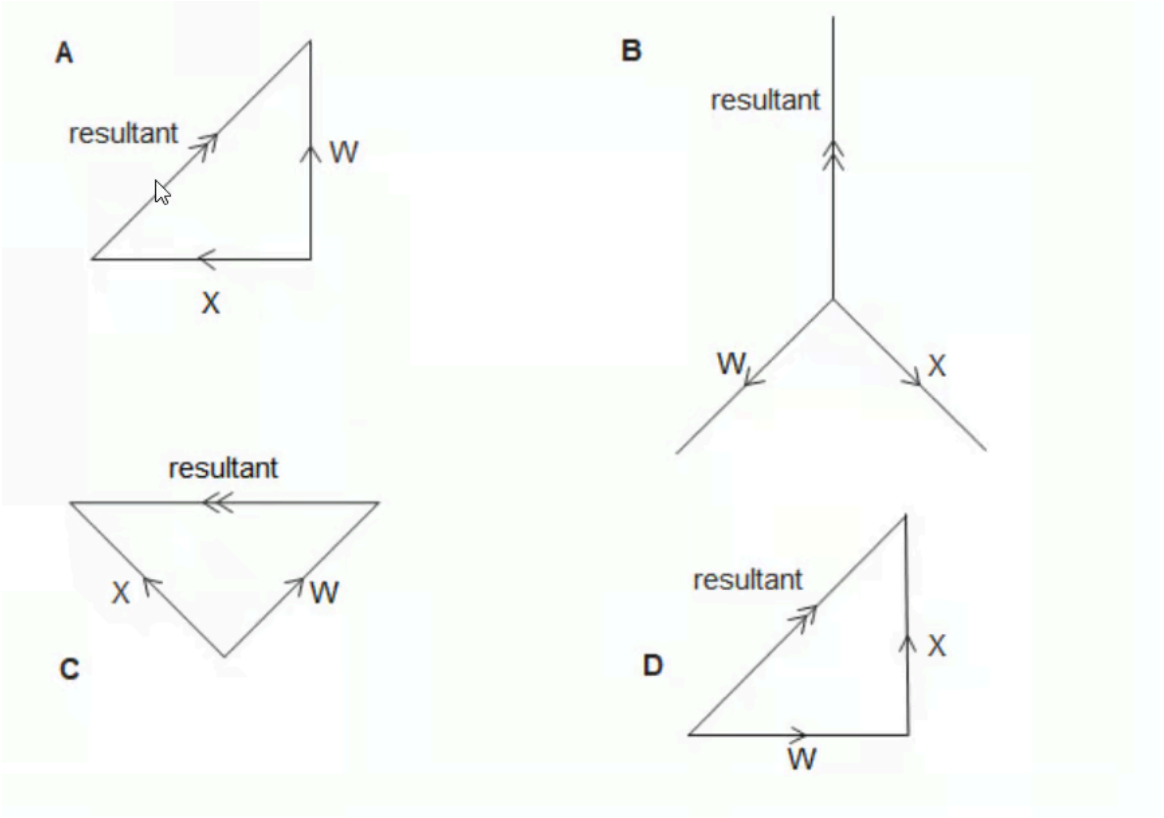
B. 13.3 cm^3

C. 16.7 cm^3

D. 40.0 cm^3

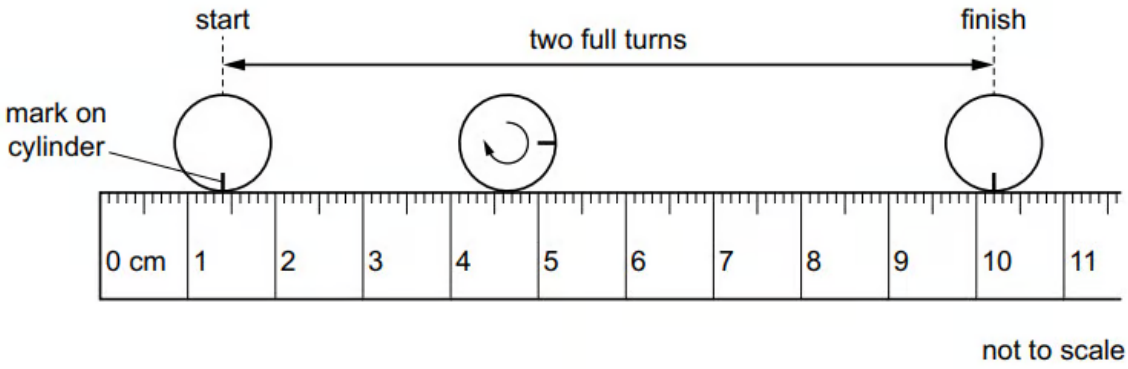
(1 mark)

5 Which of the diagrams below correctly shows two forces , W and X with their resultant?



(1 mark)

6 A small cylinder is rolled along a ruler and completes two full turns as shown in the diagram.



What is the circumference of the cylinder?

A. 4.4cm

B. 5.1cm

C. 8.8cm

D. 10.2cm

(1 mark)

7 A list of various quantities is shown.

acceleration

displacement

force

length

mass

velocity

How many of these quantities are vectors?

A. 2

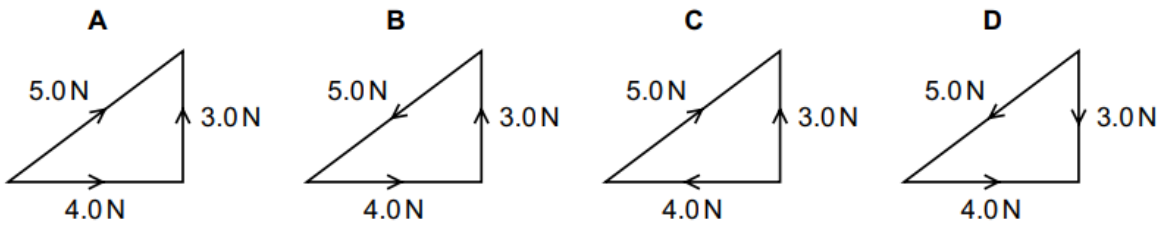
B. 3

C. 4

D. 5

(1 mark)

8 Which diagram shows the vector addition of a 4.0N force and a 3.0N force?



(1 mark)

9 A student determines the circumference of a football.

Which instrument gives a reading that is the circumference of the football?

A. calipers

B. micrometer

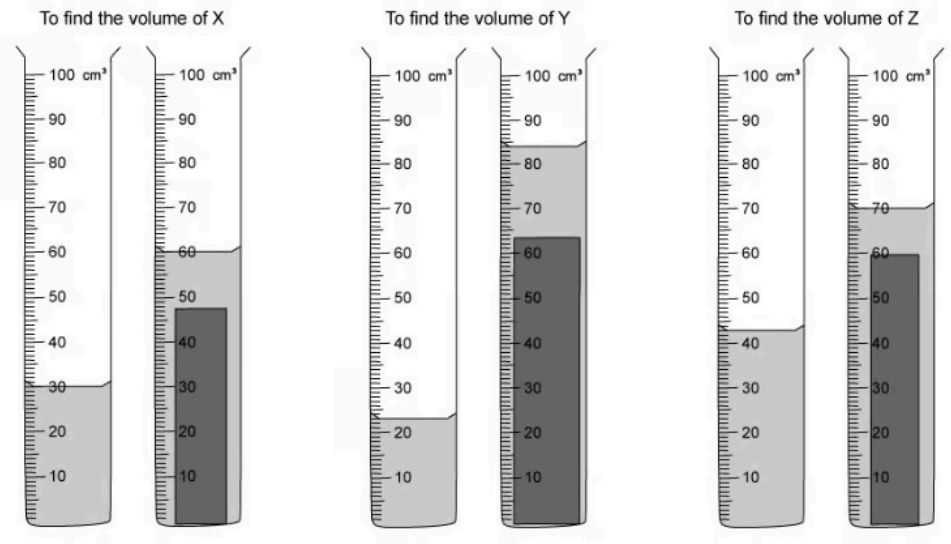
C. rule

D. tape

(1 mark)

Hard Questions

1 Three blocks are placed into three measuring cylinders. These are shown below.



Which row in the table shows the blocks in order of increasing volume?

	Smallest volume → Largest volume		
A	X	Y	Z
B	Y	X	Z
C	Z	Y	X
D	Z	X	Y

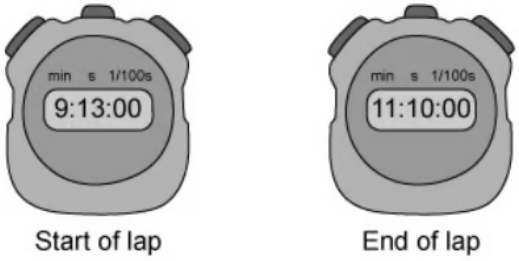
(1 mark)

2 A student is trying to see how quickly they can run 5.0 km on a standard 400 m running track.

They reason that, if they know how fast they can run one lap, they can assume they will run at the same speed for 5.0 km, and can calculate their predicted time.

They, correctly, reason that they will not be able to maintain their initial pace throughout the whole 5.0 km, so they decide to time lap 5.

The diagram shows the reading on the stopwatch at the beginning and the end of lap 5.



Calculate how long it should take the student to run 5.0 km.

A. 36 minutes 52.5 seconds

B. 24 minutes 22.5 seconds

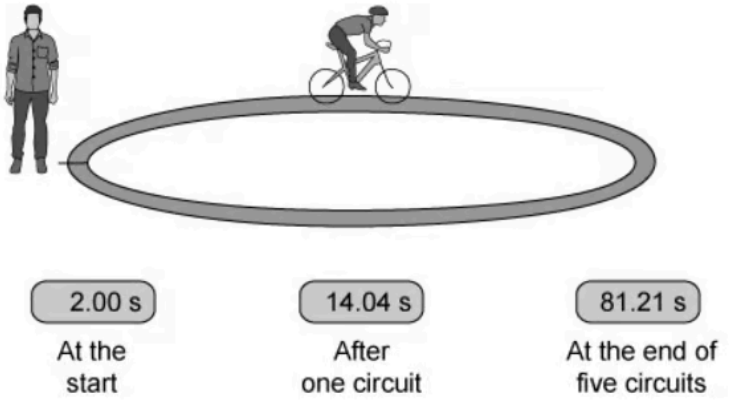
C. 13 minutes 0 seconds

D. 9 minutes 45 seconds

(1 mark)

3 An Olympic cyclist rides round a velodrome track 5 times.

The diagram below shows the reading on the stopwatch which was used to time the laps. Unfortunately, the person using the stopwatch started it a little early.



What is the average time to complete one lap of the velodrome?

A. 16.24 s

B. 14.04 s

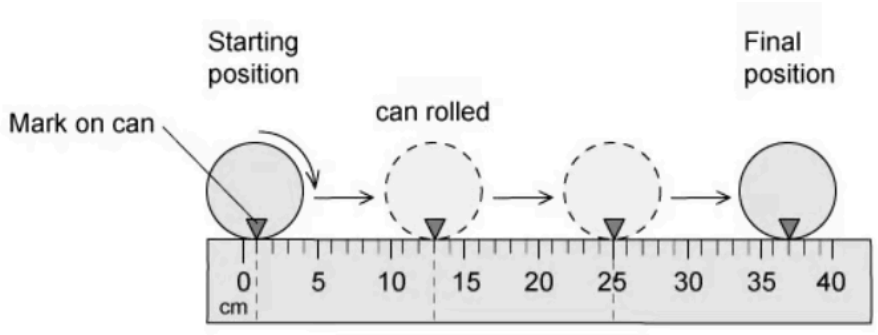
C. 15.84 s

D. 15.21 s

(1 mark)

4 A student uses a ruler to determine the circumference of a wooden dowel.

She puts a mark onto the dowel, then rolls it along the ruler three times, before reading the position on the ruler at which it stopped.



What is the circumference of the dowel?

A. 12 cm

B. 12.3 cm

C. 37 cm

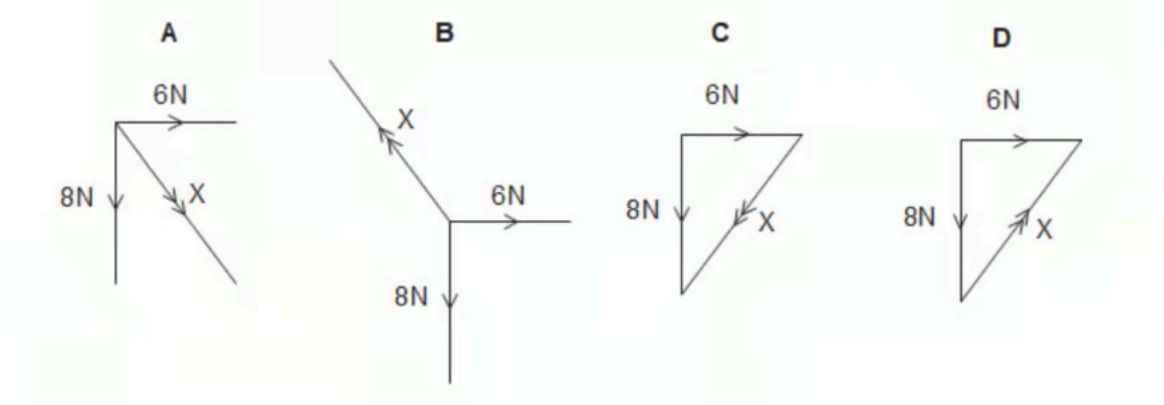
D. 36 cm

(1 mark)

5 Two forces act on an object at right angles to each other: a 6 N force and an 8 N force.

The diagrams below show the two forces.

Which diagram also shows the correct resultant force?



(1 mark)