Chapter 1

General physics

1.1 Length and time

1. 0625_m22_qp_22 Q: 1

A student investigates a pendulum.

He measures the time for the pendulum to complete 20 oscillations.

He repeats the experiment three more times.

The readings are shown.

experiment	time for 20 oscillations / s
1	17.6
2	19.8
3	17.6
4	18.6

What is the average period of the pendulum?

A 0.88 s **B** 0.92 s **C** 17.6 s **D** 18.4 s

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2. 0625_m21_qp_22 Q: 1

A student has a measuring cylinder containing water and also has a balance.

Which of these could she use to find the volume of a small metal sphere?

She has no other apparatus.

A either the measuring cylinder containing water or the balance

B the measuring cylinder containing water only

C the balance only

D neither the measuring cylinder nor the balance

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3. 0625_s21_qp_21 Q: 1

The diagram shows a stone of irregular shape.

Which property of the stone can be found by lowering it into a measuring cylinder half-filled with water?

A length

B mass

C volume

D weight

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4. 0625_s21_qp_22 Q: 1

Which piece of apparatus is the most suitable for measuring the mass of a pencil sharpener?

A digital balance

B measuring cylinder

C newton meter

D ruler

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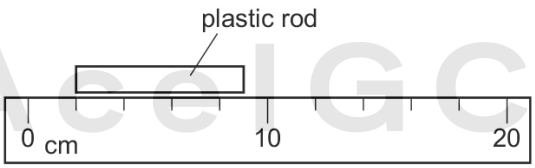
5. 0625_s21_qp_23 Q: 1

The diagram shows a plastic rod alongside a ruler.



What is the length of the rod?

A 2.5 cm **B** 3.5 cm **C** 7.0 cm **D** 9.0 cm

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6. 0625_w21_qp_21 Q: 1

Which instrument is most suitable for measuring the thickness of a single sheet of paper?

A 15 cm rule

B balance

C metre rule

D micrometer screw gauge

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7. 0625_w21_qp_22 Q: 1

A student is taking some measurements.

Which measurement is taken directly using a micrometer screw gauge?

A $0.52\,g/mm^2$ **B** $0.52\,g/mm^3$ **C** $0.52\,mm$ **D** $0.52\,mm^2$

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8. 0625_w21_qp_23 Q: 1

For which purpose is a micrometer screw gauge suitable?

A measuring the current in a coil that is known to be about 3×10^{-6} A

B measuring the diameter of a ball bearing that is known to be about 3×10^{-3} m

C measuring the mass of a grain of sand that is known to be about 3×10^{-3} g

D measuring the moment used to turn a screw that is known to be about 3×10^{-6} N m

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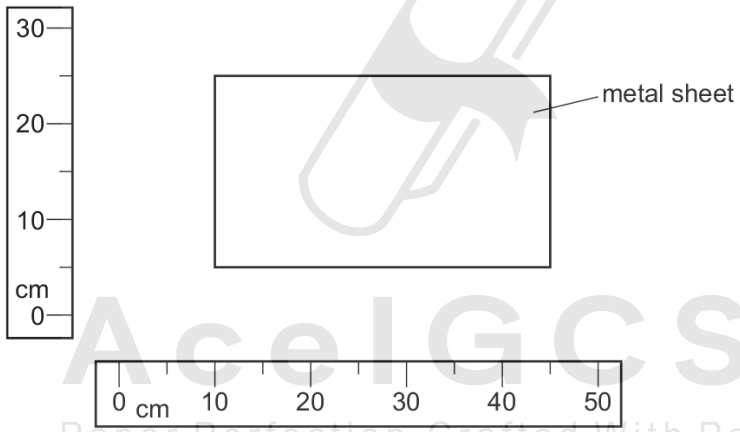
9. 0625_m20_qp_22 Q: 1

The diagram shows a rectangular metal sheet close to two rulers.



What is the area of the metal sheet?

A $700\,cm^2$ **B** $875\,cm^2$ **C** $900\,cm^2$ **D** $1125\,cm^2$

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10. 0625_p20_qp_20 Q: 2

Which measurement can be made using a micrometer screw gauge?

A the air pressure of a tyre

B the diameter of a wire

C the turning effect of a spanner

D the wavelength of microwaves

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11. 0625_s20_qp_21 Q: 1

A pendulum makes 50 complete swings in 2 min 40 s.

What is the time period for 1 complete swing?

A 1.6 s **B** 3.2 s **C** 4.8 s **D** 6.4 s

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12. 0625_s20_qp_22 Q: 1

Five athletes P, Q, R, S and T compete in a race. The table shows the finishing times for the athletes.

athlete	P	Q	R	S	T
finishing time / s	22.50	24.40	25.20	26.50	23.20

Which statement is correct?

A Athlete P won the race and was 0.70 s ahead of the athlete in second place.

B Athlete P won the race and was 1.90 s ahead of the athlete in second place.

C Athlete S won the race and was 1.30 s ahead of the athlete in second place.

D Athlete S won the race and was 2.10 s ahead of the athlete in second place.

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13. 0625_s20_qp_23 Q: 1

Diagram 1 shows a solid, rectangular-sided block.

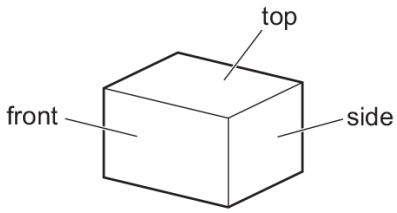

diagram 1

Diagram 2 shows the same block from the front and from the side.

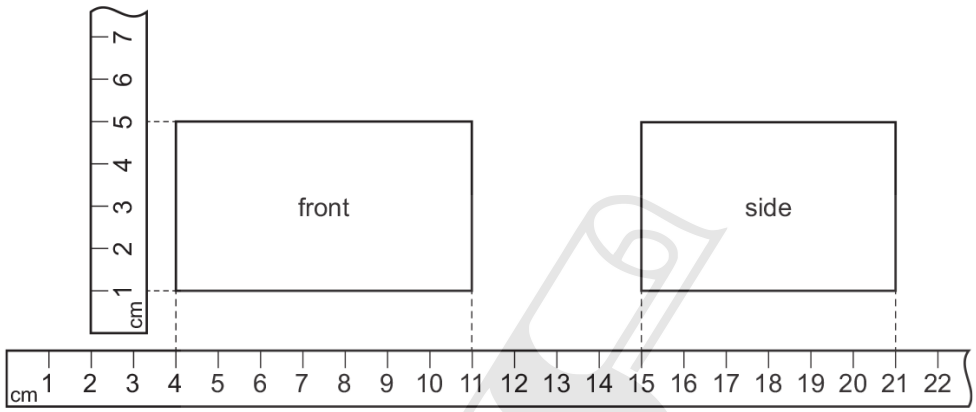

diagram 2

Metre rules have been shown close to the edges of the block.

What is the volume of the block?

A 120 cm^3 **B** 168 cm^3 **C** 264 cm^3 **D** 1155 cm^3

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14. 0625_w20_qp_21 Q: 1

For which one of the following measurements would a micrometer screw gauge be most suitable?

A length of this page

B length of a pencil

C diameter of a wire

D diameter of an atom

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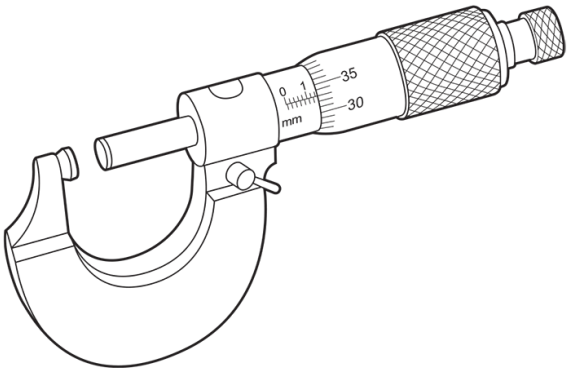
15. 0625_w20_qp_22 Q: 1

The diagram shows a measuring device.



For which measurement is this device suitable?

A diameter of a cylinder of aluminium of about 20 cm

B distance between two molecules of zinc

C length of a rod of iron of about 1 m

D thickness of a sheet of copper of about 1.5 mm

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16. 0625_w20_qp_23 Q: 1

A micrometer screw gauge reads 0.02 mm when the jaws are fully closed. It reads 0.56 mm when measuring the diameter of a metal wire.

What is the diameter of the wire?

A 0.36 mm **B** 0.54 mm **C** 0.56 mm **D** 0.58 mm

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17. 0625_m19_qp_22 Q: 1

Which row shows the best choice of measuring instruments to obtain accurate values for the distances shown?

	diameter of wire	height of bench	length of laboratory
A	measuring tape	measuring tape	micrometer screw gauge
B	metre rule	micrometer screw gauge	measuring tape
C	micrometer screw gauge	measuring tape	metre rule
D	micrometer screw gauge	metre rule	measuring tape

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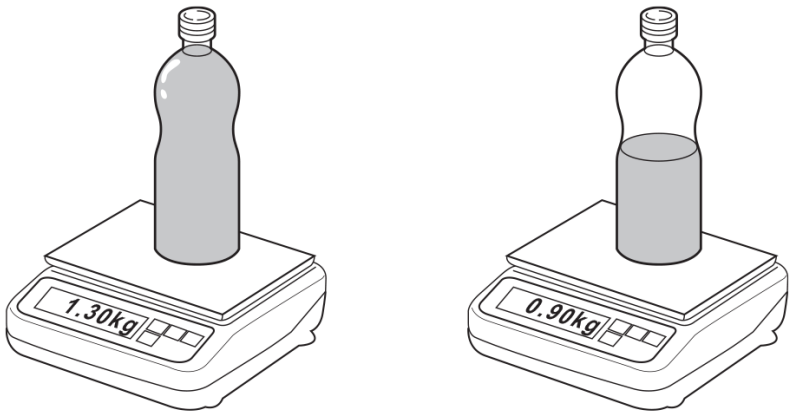
18. 0625_m19_qp_22 Q: 5

The mass of a full bottle of cooking oil is 1.30 kg.

When exactly half of the oil has been used, the mass of the bottle plus the remaining oil is 0.90 kg.



What is the mass of the empty bottle?

A 0.40 kg **B** 0.50 kg **C** 0.65 kg **D** 0.80 kg

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19. 0625_s19_qp_22 Q: 1

Which quantity can be measured directly using a micrometer screw gauge?

A the area of a sheet of paper

B the mass of a sheet of paper

C the thickness of a sheet of paper

D the volume of a sheet of paper

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20. 0625_w19_qp_21 Q: 1

A student measures the diameter of a pencil.

Which measuring instrument will give the most precise reading?

A a measuring tape

B a metre rule

C a micrometer screw gauge

D a ruler

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21. 0625_w19_qp_22 Q: 1

A student measures the dimensions of a cylindrical glass beaker.

For which measurement should she use a micrometer screw gauge?

A circumference of the beaker

B diameter of the beaker

C height of the beaker

D thickness of the glass wall of the beaker

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22. 0625_w19_qp_23 Q: 1

Which is the best apparatus to use to measure the thickness of a coin?

A balance

B ruler with a millimetre scale

C micrometer screw gauge

D pressure gauge

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23. 0625_m18_qp_22 Q: 1

Which instrument is used to measure accurately the diameter of a thin metal wire?

A 30 cm ruler

B measuring tape

C metre rule

D micrometer screw gauge

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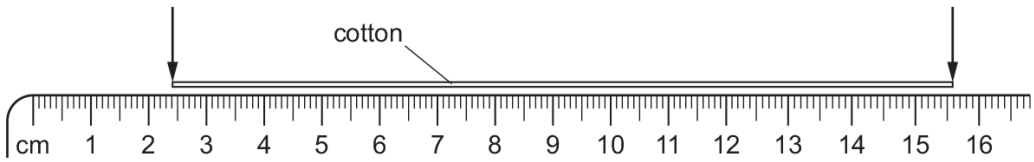
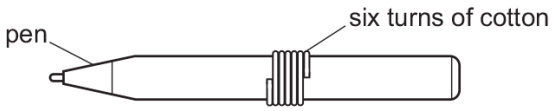
24. 0625_s18_qp_21 Q: 1

A length of cotton is measured between two points on a ruler.



When the length of cotton is wound closely around a pen, it goes round six times.



What is the distance once round the pen?

A 2.2 cm **B** 2.6 cm **C** 13.2 cm **D** 15.6 cm

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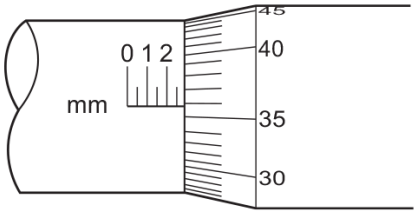
25. 0625_w18_qp_21 Q: 1

The diagram shows part of a micrometer screw gauge.



What is the smallest reading that can be achieved using this micrometer screw gauge?

A 0.0001 mm **B** 0.01 mm **C** 0.1 mm **D** 1 mm

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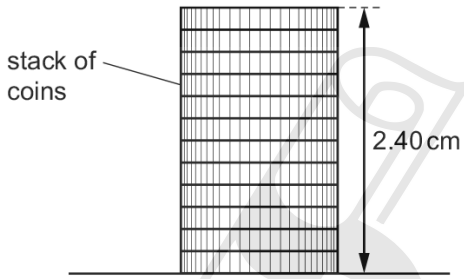
26. 0625_m17_qp_22 Q: 1

The diagram shows the height of a stack of identical coins.



What is the thickness of one coin?

A 0.20 mm **B** 2.0 mm **C** 0.24 cm **D** 2.0 cm

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27. 0625_s17_qp_22 Q: 1

What is the most accurate and precise method to measure the thickness of a coin?

A Use a micrometer screw gauge.

B Use a ruler and look at the scale perpendicularly.

C Use a top pan balance.

D Use the displacement method with water in a measuring cylinder.

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28. 0625_s17_qp_23 Q: 2

A pendulum is swinging. Five students each measure the time it takes to swing through ten complete swings.

Three students measure the time as 17.2 s. Another student measures it as 16.9 s, and the fifth student measures it as 17.0 s.

What is the average period of the pendulum?

A 1.69 s **B** 1.70 s **C** 1.71 s **D** 1.72 s

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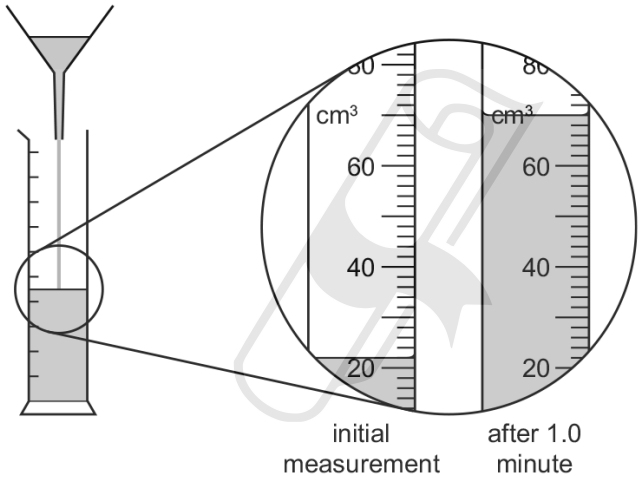
29. 0625_w17_qp_22 Q: 1

A student investigates the rate of flow of oil through a funnel.

The diagrams show the experiment and the volume of oil in the measuring cylinder at the start of the experiment, and one minute later.



What is the rate of flow of oil through the funnel during the one minute?

A 0.73 cm^3/s **B** 0.80 cm^3/s **C** 44 cm^3/s **D** 48 cm^3/s

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30. 0625_m16_qp_22 Q: 1

The diameter of a copper wire is thought to be approximately 0.3 mm.

Which instrument should be used to obtain a more accurate measurement of the diameter of the wire?

A measuring tape

B metre rule

C micrometer

D ruler

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31. 0625_p16_qp_20 Q: 2

Which measurement can be made using a micrometer screw gauge?

A the air pressure of a tyre

B the diameter of a wire

C the turning effect of a spanner

D the wavelength of microwaves

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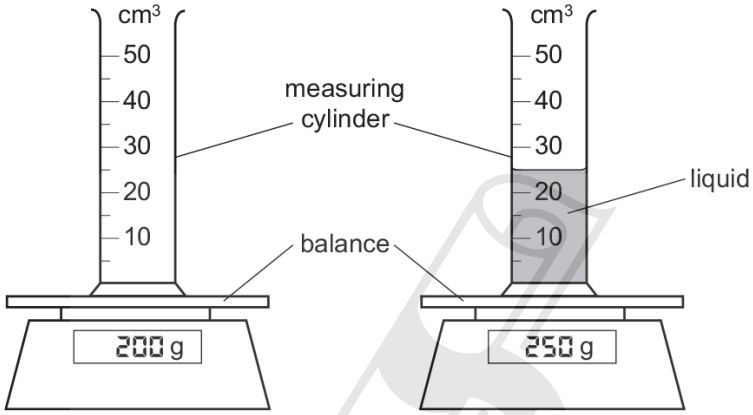
32. 0625_p16_qp_20 Q: 5

The diagram shows an experiment to find the density of a liquid.



What is the density of the liquid?

A $0.5\,g/cm^3$ **B** $2.0\,g/cm^3$ **C** $8.0\,g/cm^3$ **D** $10.0\,g/cm^3$

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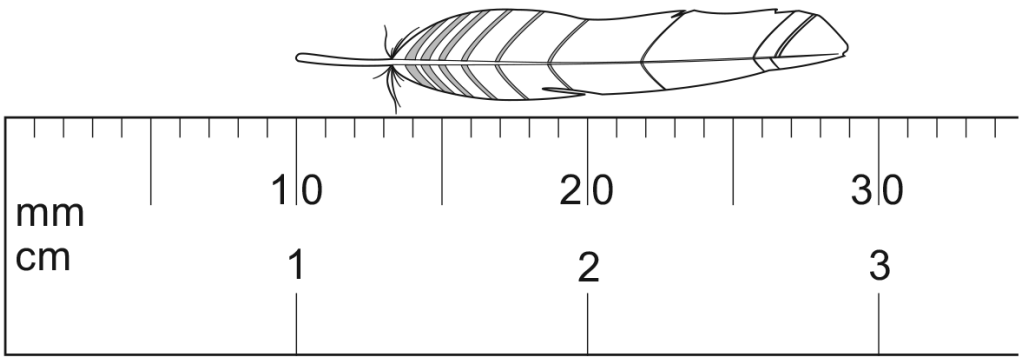
33. 0625_s16_qp_21 Q: 1

The diagram shows an enlarged drawing of the end of a metre rule. It is being used to measure the length of a small feather.



What is the length of the feather?

A 19 mm **B** 29 mm **C** 19 cm **D** 29 cm

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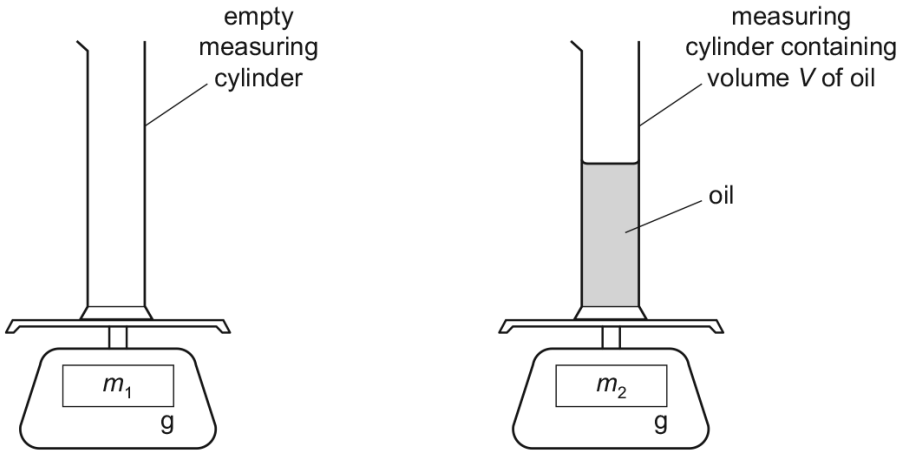
34. 0625_w16_qp_22 Q: 5

A student uses a measuring cylinder and a balance to find the density of oil. The diagram shows the arrangement used.



Which calculation gives the density of the oil?

A $\frac{V}{m_2}$ **B** $\frac{V}{(m_2 - m_1)}$ **C** $\frac{m_2}{V}$ **D** $\frac{(m_2 - m_1)}{V}$

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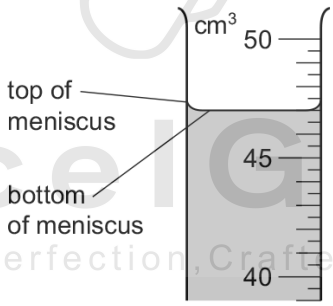
35. 0625_m15_qp_12 Q: 1

A student uses a measuring cylinder to measure the volume of some water. The diagram shows part of the measuring cylinder. The top and bottom of the meniscus are labelled.



What is the volume of the water?

A 47.0 cm^3 **B** 47.5 cm^3 **C** 49.0 cm^3 **D** 49.5 cm^3

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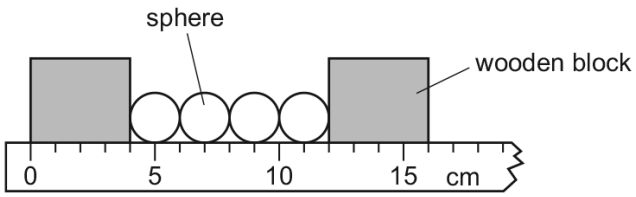
36. 0625_s15_qp_12 Q: 1

The diagram shows four identical spheres placed between two wooden blocks on a ruler.



What is the diameter of one sphere?

A 1.0 cm **B** 2.0 cm **C** 3.0 cm **D** 4.0 cm

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37. 0625_s15_qp_13 Q: 1

A cook wants to prepare some food to be cooked by 1.15 p.m. He uses an oven with an automatic timer that can be set to switch on and off at certain times. The oven needs to be switched on for 2 hours 10 minutes.

At which time does the oven need to switch on?

A 11.05 a.m. **B** 11.25 a.m. **C** 3.05 p.m. **D** 3.25 p.m.

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38. 0625_w15_qp_11 Q: 1

Which option contains **only** apparatus that could be used to determine the volume of a small block of unknown material?

A measuring cylinder, metre rule

B measuring cylinder, stopwatch

C metre rule, balance

D metre rule, stopwatch

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39. 0625_w15_qp_13 Q: 1

A student uses a measuring cylinder to measure the volume of a quantity of water.

Which action would make her result **less** accurate?

A making sure her eye is level with the water surface

B making sure the cylinder is vertical

C reading the bottom of the meniscus

D using the largest measuring cylinder possible

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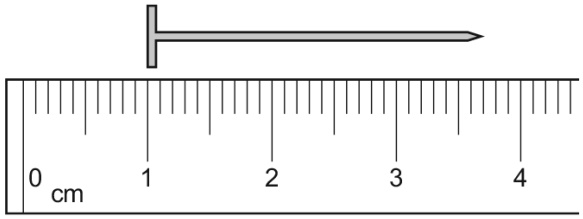
40. 0625_s14_qp_12 Q: 1

The diagram shows part of a ruler. The ruler is used to find the length of a nail.



What is the length of the nail?

A 2.2 cm **B** 2.7 cm **C** 3.2 cm **D** 3.7 cm

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41. 0625_s14_qp_13 Q: 1

Which instrument is used to compare the masses of objects?

A a balance

B a barometer

C a manometer

D a measuring cylinder

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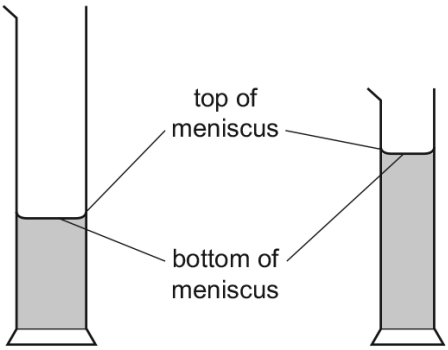
42. 0625_s14_qp_13 Q: 4

A student wishes to measure accurately the volume of approximately 40 cm^3 of water. She has two measuring cylinders, a larger one that can hold 100 cm^3, and a smaller one that can hold 50 cm^3. The water forms a meniscus where it touches the glass.



Which cylinder should the student use and which water level should she use to ensure an accurate result?

	cylinder	water level
A	larger one	bottom of meniscus
B	larger one	top of meniscus
C	smaller one	bottom of meniscus
D	smaller one	top of meniscus

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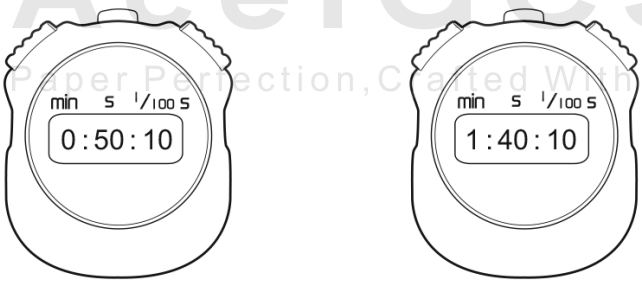
43. 0625_w14_qp_13 Q: 1

A stopwatch is used to time a runner in a race. The diagrams show the stopwatch at the start and at the end of a lap of the race.



start of lap end of lap

How long did the runner take to finish the lap of the race?

A 50.00 seconds

B 50.10 seconds

C 90.00 seconds

D 100.10 seconds

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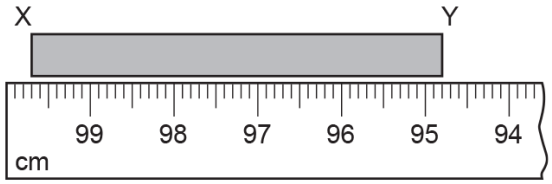
44. 0625_s13_qp_12 Q: 1

A student measures the length of a rod XY by holding it next to a metre rule.



The student writes down the length as 94.8 cm.

Which statement is correct?

A The value is correct.

B The value is incorrect because it should be 95.2 cm.

C The value is incorrect because it should be in millimetres.

D The value is incorrect because the student should subtract the reading for end Y from the reading for end X.

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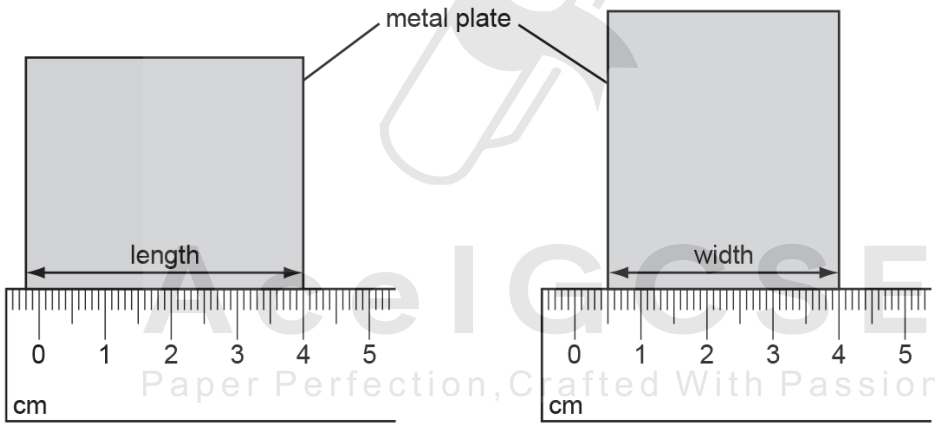
45. 0625_w13_qp_11 Q: 1

A student uses a ruler to measure the length and the width of a small rectangular metal plate.



What is the area of the plate?

A 14.0 cm^2 **B** 14.7 cm^2 **C** 16.0 cm^2 **D** 16.8 cm^2

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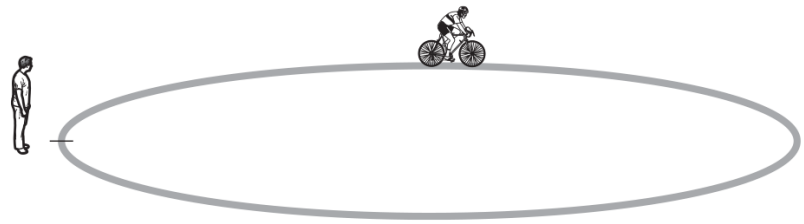
46. 0625_w13_qp_13 Q: 1

A cyclist rides round a track three times.



Her friend uses a stopwatch to record the time at the start of the ride, after one circuit, and at the end of the three circuits. The readings from the stopwatch are shown.

What is the average time for one circuit of the track?

A 174 s **B** 180 s **C** 198 s **D** 200 s

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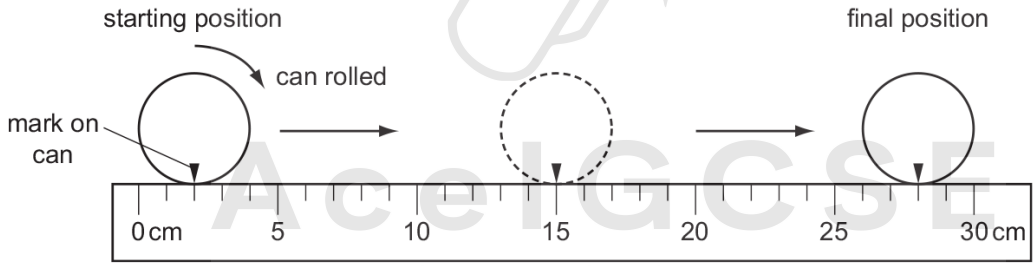
47. 0625_s12_qp_11 Q: 1

A cylindrical can is rolled along the ruler shown in the diagram.



The can rolls over twice.

What is the circumference (distance all round) of the can?

A 13 cm **B** 14 cm **C** 26 cm **D** 28 cm

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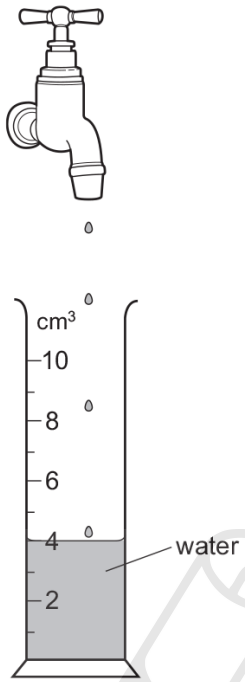
48. 0625_s12_qp_12 Q: 2

Drops of water are dripping steadily from a tap (faucet). The diagram shows a measuring cylinder which has collected 120 drops of water.



How many drops in total will have been collected when the measuring cylinder reads 10 cm^3?

A 48 **B** 60 **C** 180 **D** 300

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49. 0625_w12_qp_13 Q: 1

A pendulum is set in motion and timed. The time measured for 20 complete swings is 30 s.

What is the time for one complete swing of the pendulum?

A 0.67 s **B** 0.75 s **C** 1.5 s **D** 3.0 s

SN	Paper	Q. No.	Answer
1	0625_m22_qp_22	1	B
2	0625_m21_qp_22	1	B
3	0625_s21_qp_21	1	C
4	0625_s21_qp_22	1	A
5	0625_s21_qp_23	1	C
6	0625_w21_qp_21	1	D
7	0625_w21_qp_22	1	C
8	0625_w21_qp_23	1	B
9	0625_m20_qp_22	1	A
10	0625_p20_qp_20	2	B
11	0625_s20_qp_21	1	B
12	0625_s20_qp_22	1	A
13	0625_s20_qp_23	1	B
14	0625_w20_qp_21	1	C
15	0625_w20_qp_22	1	D
16	0625_w20_qp_23	1	B
17	0625_m19_qp_22	1	D
18	0625_m19_qp_22	5	B
19	0625_s19_qp_22	1	C
20	0625_w19_qp_21	1	C
21	0625_w19_qp_22	1	D
22	0625_w19_qp_23	1	C
23	0625_m18_qp_22	1	D
24	0625_s18_qp_21	1	A
25	0625_w18_qp_21	1	B
26	0625_m17_qp_22	1	B
27	0625_s17_qp_22	1	A
28	0625_s17_qp_23	2	C
29	0625_w17_qp_22	1	B
30	0625_m16_qp_22	1	C
31	0625_p16_qp_20	2	B
32	0625_p16_qp_20	5	B
33	0625_s16_qp_21	1	A
34	0625_w16_qp_22	5	D
35	0625_m15_qp_12	1	A
36	0625_s15_qp_12	1	B
37	0625_s15_qp_13	1	A
38	0625_w15_qp_11	1	A
39	0625_w15_qp_13	1	D
40	0625_s14_qp_12	1	B
41	0625_s14_qp_13	1	A
42	0625_s14_qp_13	4	C
43	0625_w14_qp_13	1	A
44	0625_s13_qp_12	1	D
45	0625_w13_qp_11	1	B
46	0625_w13_qp_13	1	C
47	0625_s12_qp_11	1	A
48	0625_s12_qp_12	2	D
49	0625_w12_qp_13	1	C