8.1 Reasoning: Measurement and Geometry: 2-hour Pack

STA KS2 National Curriculum Mathematics - STA Reasoning Test Framework · Calculators not allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A tank is 50 cm long, 40 cm wide and 40 cm high.

How many litres of water does it hold when full? (1 litre = 1,000 cm cubed.)

Answer: ___ litres

(2)

---

2 An isosceles triangle has an angle of 24 degrees between its two equal sides.

What size is each of the other two angles?

Answer: ___ degrees

(2)

---

3 A rectangle is 7 m long and 9 m wide.

What is its area in square metres?

Answer: ___

(1)

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4 A bottle holds 400 ml of squash. Isla fills glasses that each hold 200 ml.

How many glasses can be filled?

Answer: ___

(1)

---

5 A right angle is split into two angles. One of them is 51 degrees.

What is the other?

Answer: ___ degrees

(1)

---

6 The minute hand of a clock turns clockwise from 12 to the number 6.

Through how many degrees has it turned?

Answer: ___ degrees

(2)

---

7 Points C and D are at (-2, 4) and (3, 4). Each grid square is 1 unit wide.

How far is C from D?

Answer: ___ units

(1)

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8 A rectangular vegetable patch measures 6m by 4.5m. Turf to cover the patch costs £3.50 per m^2.

(a) Calculate the area of the vegetable patch. **(1)**

.....

(b) Calculate the total cost of the turf needed to cover the whole patch. **(2)**

.....

9 A train leaves at 07:38 and arrives at 13:06.

How many minutes does it take?

Answer: ___ minutes

(1)

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10 A rectangle is 8 m long and 7 m wide.

What is its area in square metres?

Answer: ___

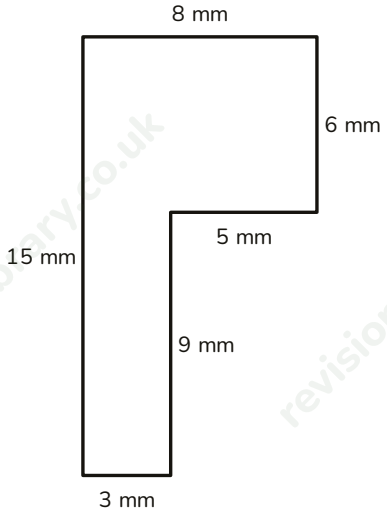
(1)

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11 An L-shaped floor has these sides in order around the shape: 8 mm, 6 mm, 5 mm, 9 mm, 3 mm, 15 mm.

What is the perimeter of the floor?

Answer: ___ mm



(2)

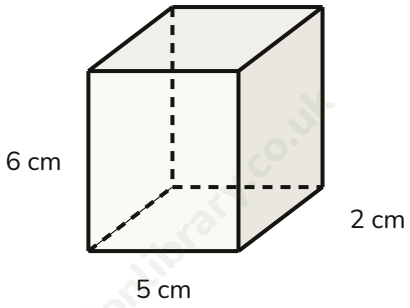
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12 A cuboid measures 5 cm by 2 cm by 6 cm.

What is its volume in cubic centimetres?

Answer: ___ cm cubed

Diagram NOT accurately drawn



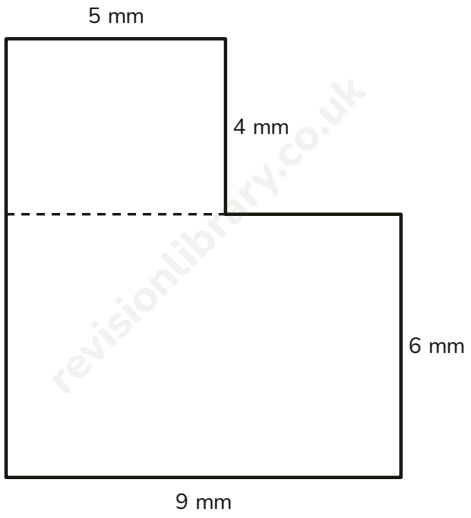
(1)

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13 An L-shape is made from two rectangles joined together. The first rectangle is 9 mm by 6 mm. The second is 5 mm by 4 mm.

What is the total area of the L-shape in square millimetres?

Answer: ___



(2)

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14 How many triangles can you make by drawing lines from one corner of a nonagon to every other corner it is not already joined to?

Answer: ___

(2)

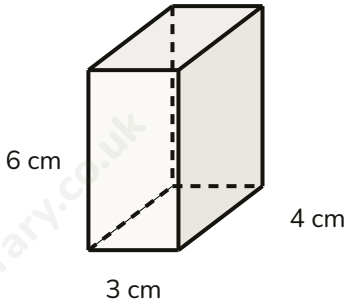
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15 A cuboid measures 3 cm by 4 cm by 6 cm.

What is its volume in cubic centimetres?

Answer: ___ cm cubed

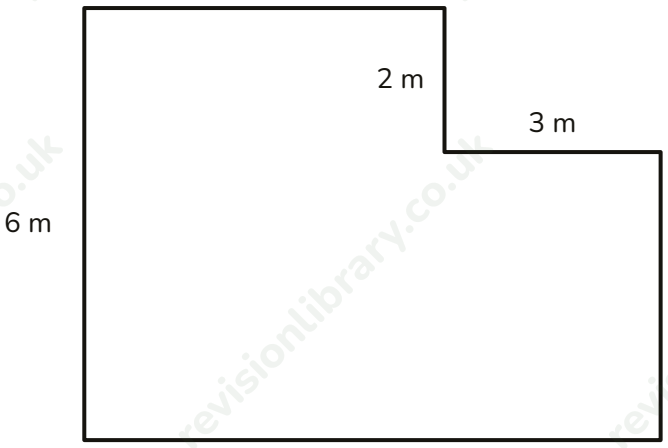
Diagram NOT accurately drawn



(1)

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16 The diagram shows an L-shaped patio. It is formed from an 8m by 6m rectangle with a 3m by 2m rectangular corner removed from the top-right corner. The two missing side lengths are not labelled on the diagram.



(diagram not to scale)

(a) Calculate the area of the patio. **(3)**

.....

(b) Calculate the perimeter of the patio. **(3)**

.....

17 An isosceles triangle has two equal angles of 56 degrees each.

What is the third angle?

Answer: ___ degrees

(2)

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18 Point B is at (3, 5). It is reflected in the x-axis.

What are the coordinates of the image of B?

Answer: (___, ___)

(1)

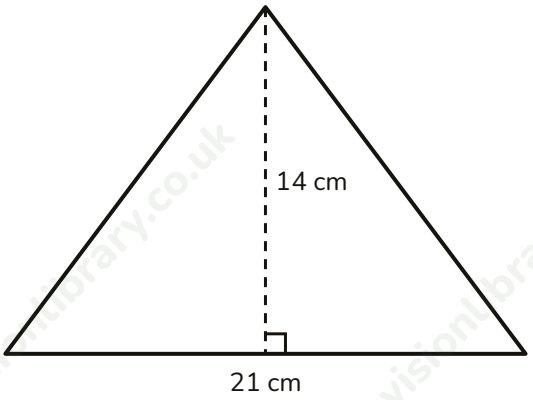
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19 A triangle has a base of 21 cm and a perpendicular height of 14 cm.

What is its area in square centimetres?

Answer: ___

Diagram NOT accurately drawn



(2)

---

20 Convert 83.3 cm to mm.

Answer: ___ mm

(1)

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21 A rectangle is 37 m long and 19 m wide.

What is its perimeter?

Answer: ___ m

(1)

---

22 A rectangle is 16 m long and 3 m wide.

What is its area in square metres?

Answer: ___

(1)

---

23 A jug holds 3.25 litres of juice. Jade pours it into glasses that each hold 50 ml.

How many glasses can be filled?

Answer: ___

(2)

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24 A regular octagon has sides of length 19 cm.

What is its perimeter?

Answer: ___ cm



(1)

---

25 Two angles lie on a straight line. One of the angles is 118 degrees. Calculate the size of the other angle.

(2)

---

26 The minute hand of a clock turns clockwise from 12 to the number 10.

Through how many degrees has it turned?

Answer: ___ degrees

(2)

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27 An angle on a diagram is 118 degrees. What is the size of the angle needed to complete a full turn?

Answer: ___ degrees

(1)

---

28 A bottle holds 1,800 ml of squash. Mia fills glasses that each hold 200 ml.

How many glasses can be filled?

Answer: ___

(1)

---

29 A line joins (2, 7) and (4, 7).

What are the coordinates of the midpoint of the line?

Answer: (___, ___)

(1)

---

30 Three angles in a quadrilateral are 120, 104 and 85 degrees.

What is the fourth angle?

Answer: ___ degrees

(2)

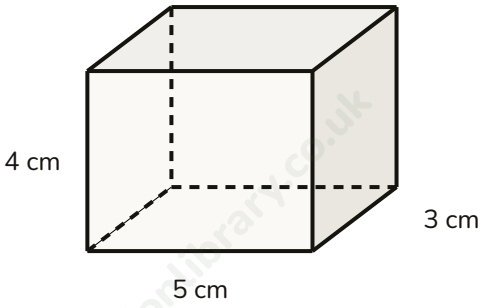
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31 A box is 5 cm long, 3 cm wide and 4 cm high. It is filled with 1 cm cubes.

How many cubes are needed to fill the box?

Answer: ___

Diagram NOT accurately drawn



(2)

---

32 A bottle holds 600 ml of squash. Hana fills glasses that each hold 200 ml.

How many glasses can be filled?

Answer: ___

(1)

---

33 A ribbon is 9 m long. Amira cuts it into pieces that are each 40 cm long.

How many pieces does Amira cut?

Answer: ___

(2)

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34 A rectangle measures 14 m by 12 m. A smaller rectangle 10 m by 10 m is cut out of one corner.

What is the area of the shape that is left, in square metres?

Answer: ___

(3)

---

35 An angle on a diagram is 168 degrees. What is the size of the angle needed to complete a full turn?

Answer: ___ degrees

(1)

---

36 A rectangle has a perimeter of 78 km. Its length is 29 km.

What is its width?

Answer: ___ km



29 km

Perimeter = 78 km

(2)

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37 A coach leaves at 08:14 and arrives at 11:43.

How many minutes does it take?

Answer: ___ minutes

(2)

---

38 Convert 39.6 kg to g.

Answer: ___ g

(1)

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39 Convert 30 m to cm.

Answer: ___ cm

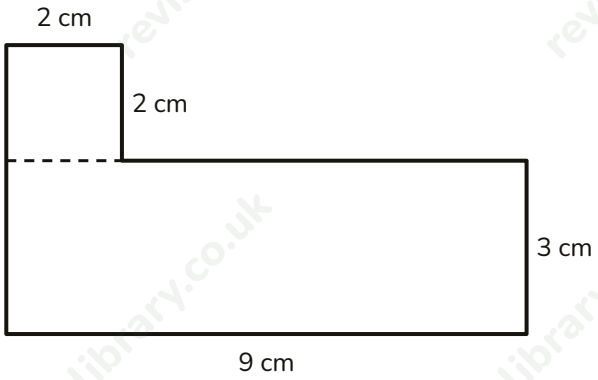
(1)

---

40 An L-shape is made from two rectangles joined together. The first rectangle is 9 cm by 3 cm. The second is 2 cm by 2 cm.

What is the total area of the L-shape in square centimetres?

Answer: ___



(3)

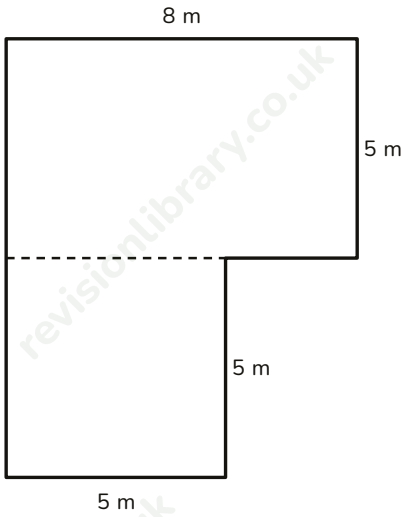
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41 An L-shape is made from two rectangles joined together. The first rectangle is 5 m by 8 m. The second is 5 m by 5 m.

What is the total area of the L-shape in square metres?

Answer: ___

Diagram NOT accurately drawn



(2)

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42 Triangle ABC is isosceles. The angle at the apex, A, is 42 degrees. Calculate the size of each of the two equal base angles.

(3)

---

43 A square has sides of length 12 cm.

What is its perimeter?

Answer: ___ cm

Diagram NOT accurately drawn



12 cm

(1)

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44 A rectangle has an area of 112 square centimetres. Its length is 14 cm.

What is its width?

Answer: ___ cm

Diagram NOT accurately drawn



(2)

---

45 A rectangle is 24 m long and 4 m wide.

What is its area in square metres?

Answer: ___

(1)

---

46 Convert 20 km to m.

Answer: ___ m

(1)

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47 A square has sides of length 44 mm.

What is its perimeter?

Answer: ___ mm

Diagram NOT accurately drawn



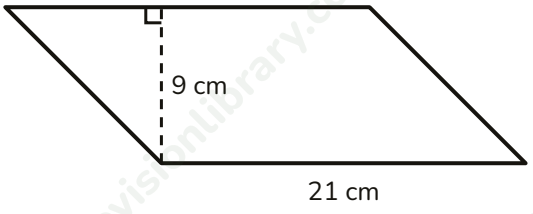
(1)

48 A parallelogram has a base of 21 cm and a perpendicular height of 9 cm.

What is its area in square centimetres?

Answer: ___

Diagram NOT accurately drawn



(2)

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49 The minute hand of a clock turns clockwise from 12 to the number 7.

Through how many degrees has it turned?

Answer: ___ degrees

(2)

---

50 How many triangles can you make by drawing lines from one corner of a octagon to every other corner it is not already joined to?

Answer: ___

(2)

---

51 A square has sides of length 3 mm.

What is its area in square millimetres?

Answer: ___

Diagram NOT accurately drawn



3 mm

(1)

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52 An isosceles triangle has two equal angles of 40 degrees each.

What is the third angle?

Answer: ___ degrees

(2)

---

53 Hana has a 9 m roll of wire. Hana uses 693 cm of it.

How many centimetres of wire are left?

Answer: ___ cm

(2)

---

54 A lesson starts at 13:51 and takes 31 minutes.

What time does it finish? Write your answer as a 24-hour clock time.

Answer: ___

(2)

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55 A square has sides of length 24 mm.

What is its perimeter?

Answer: ___ mm

Diagram NOT accurately drawn



24 mm

(1)

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56 A rectangle is 12 cm long and 11 cm wide.

What is its area in square centimetres?

Answer: ___

(1)

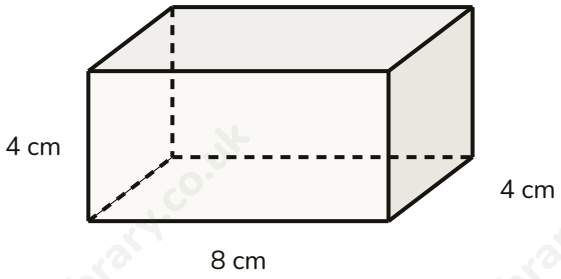
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57 A box is 8 cm long, 4 cm wide and 4 cm high. It is filled with 1 cm cubes.

How many cubes are needed to fill the box?

Answer: ___

Diagram NOT accurately drawn



(2)

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Mark scheme · 8.1 Reasoning: Measurement and Geometry: 2-hour Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

80,000 cm cubed seen	M1
80 litres cao	A1

Answer: **80 litres**

Question 2

156 seen	M1
78 degrees cao	A1

Answer: **78 degrees**

Question 3

63 square metres cao	B1

Answer: **63 square metres**

Question 4

2 cao	B1

Answer: **2**

Question 5

39 degrees cao	B1

Answer: **39 degrees**

Question 6

30 degrees for each number	M1
180 degrees cao	A1

Answer: **180 degrees**

Question 7

5 units cao	B1

Answer: **5 units**

Question 8

(a) 27 m^2 cao	B1

(a) Answer: **27 m^2**

(b) 27 x 3.50 ft from (a)	M1
(b) £94.50 cao	A1

(b) Answer: **£94.50**

Question 9

328 minutes cao	B1

Answer: **328 minutes**

Question 10

56 square metres cao	B1

Answer: **56 square metres**

Question 11

adds all six sides	M1
46 mm cao	A1

Answer: **46 mm**

Question 12

60 cm cubed cao	B1

Answer: **60 cm cubed**

Question 13

finds the area of each rectangle	M1
74 square millimetres cao	A1

Answer: **74 square millimetres**

Question 14

identifies the corners not already joined	M1
7 cao	A1

Answer: **7**

Question 15

72 cm cubed cao	B1

Answer: **72 cm cubed**

Question 16

(a) 8 x 6 = 48 m^2 (area of full rectangle)	M1
(a) 3 x 2 = 6 m^2 (area removed)	M1
(a) 42 m^2 cao	A1

(a) Answer: **42 m^2**

(b) finds missing side lengths: 8-3=5m and 6-2=4m	M1
(b) sums all six sides: 8+6+5+2+3+4 oe	M1
(b) 28m cao	A1

(b) Answer: **28m**

Question 17

112 seen	M1
68 degrees cao	A1

Answer: **68 degrees**

Question 18

(3, -5) cao	B1

Answer: **(3, -5)**

Question 19

21 x 14 seen	M1
147 square centimetres cao	A1

Answer: **147 square centimetres**

Question 20

833 mm cao	B1

Answer: **833 mm**

Question 21

112 m cao	B1

Answer: **112 m**

Question 22

48 square metres cao	B1

Answer: **48 square metres**

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Question 23

3.25 litres = 3,250 ml seen	M1
65 cao	A1

Answer: **65**

Question 24

152 cm cao	B1

Answer: **152 cm**

Question 25

180 - 118 oe	M1
62 degrees cao	A1

Answer: **62 degrees**

Question 26

30 degrees for each number	M1
300 degrees cao	A1

Answer: **300 degrees**

Question 27

242 degrees cao	B1

Answer: **242 degrees**

Question 28

9 cao	B1

Answer: **9**

Question 29

(3, 7) cao	B1

Answer: **(3, 7)**

Question 30

309 seen	M1
51 degrees cao	A1

Answer: **51 degrees**

Question 31

volume formula seen	M1
60 cao	A1

Answer: **60**

Question 32

3 cao	B1

Answer: **3**

Question 33

9 m = 900 cm seen	M1
22 cao	A1

Answer: **22**

Question 34

finds both areas	M1
subtracts	M1
68 square metres cao	A1

Answer: **68 square metres**

Question 35

192 degrees cao	B1

Answer: **192 degrees**

Question 36

78 - 58 = 20 seen	M1
10 km cao	A1

Answer: **10 km**

Question 37

counts on to the next hour or minutes calculation	M1
209 minutes cao	A1

Answer: **209 minutes**

Question 38

39,600 g cao	B1

Answer: **39,600 g**

Question 39

3,000 cm cao	B1

Answer: **3,000 cm**

Question 40

finds the area of each rectangle	M1
adds the two areas	M1
31 square centimetres cao	A1

Answer: **31 square centimetres**

Question 41

finds the area of each rectangle	M1
65 square metres cao	A1

Answer: **65 square metres**

Question 42

180 - 42 = 138 oe	M1
138 / 2 ft	M1
69 degrees cao	A1

Answer: **69 degrees**

Question 43

48 cm cao	B1

Answer: **48 cm**

Question 44

divides area by length	M1
8 cm cao	A1

Answer: **8 cm**

Question 45

96 square metres cao	B1

Answer: **96 square metres**

Question 46

20,000 m cao	B1

Answer: **20,000 m**

Question 47

176 mm cao	B1

Answer: **176 mm**

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Question 48

base x height	M1
189 square centimetres cao	A1

Answer: **189 square centimetres**

Question 49

30 degrees for each number	M1
210 degrees cao	A1

Answer: **210 degrees**

Question 50

identifies the corners not already joined	M1
6 cao	A1

Answer: **6**

Question 51

9 square millimetres cao	B1

Answer: **9 square millimetres**

Question 52

80 seen	M1
100 degrees cao	A1

Answer: **100 degrees**

Question 53

9 m = 900 cm seen	M1
207 cm cao	A1

Answer: **207 cm**

Question 54

adds hours then minutes	M1
14:22 cao	A1

Answer: **14:22**

Question 55

96 mm cao	B1

Answer: **96 mm**

Question 56

132 square centimetres cao	B1

Answer: **132 square centimetres**

Question 57

volume formula seen	M1
128 cao	A1

Answer: **128**

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