ICAS 2018 year 8 Math

1

Which of these has the same value as 26 000?

(A) 260 tens
(B) 260 hundreds
(C) 260 thousands
(D) 2600 hundreds

2

Ben started shading some numbers on this chart by following a pattern.

21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

What will be the largest number Ben shades if he continues this pattern?

(A) 46 (B) 47
(C) 49 (D) 50

3

This map shows the paths in a park.

How many different ways are there to walk along the paths from Gate 1 to Gate 2 without heading back towards Gate 1?

(A) 6
(B) 5
(C) 4
(D) 3

4

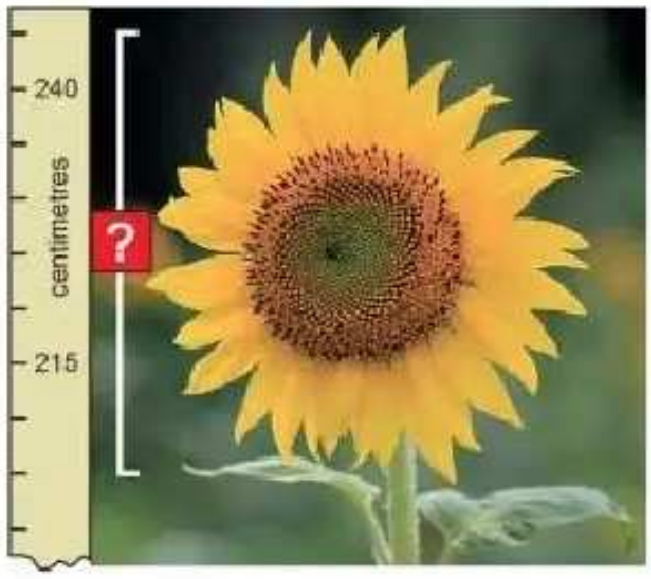
Lucy placed 13 pots around a pond as shown. Each pot has a diameter of 30 cm.

What is the perimeter of the pond?

(A) 660 cm
(B) 480 cm
(C) 450 cm
(D) 390 cm

5

Ali grew this sunflower plant for a competition. It was just over 240 cm tall.

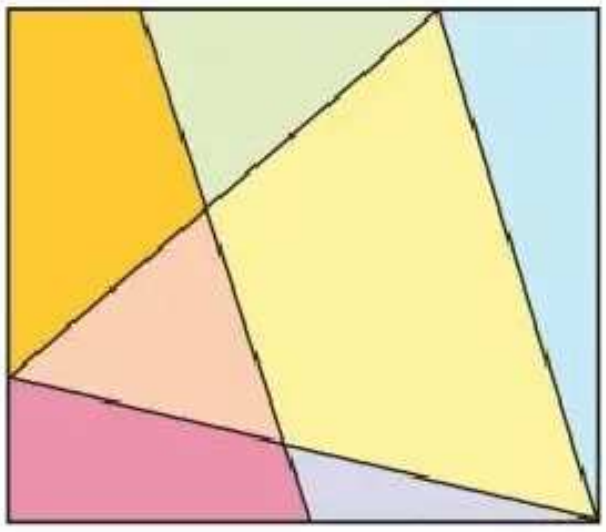


What was the approximate diameter of Ali's flower as shown by the marker?

(A) 24 cm
(B) 25 cm
(C) 32 cm
(D) 40 cm

6

James drew a rectangle with 4 lines inside it.



How many angles in his drawing are larger than a right angle?

(A) 3
(B) 4
(C) 6
(D) 7

7

Saira had $500.

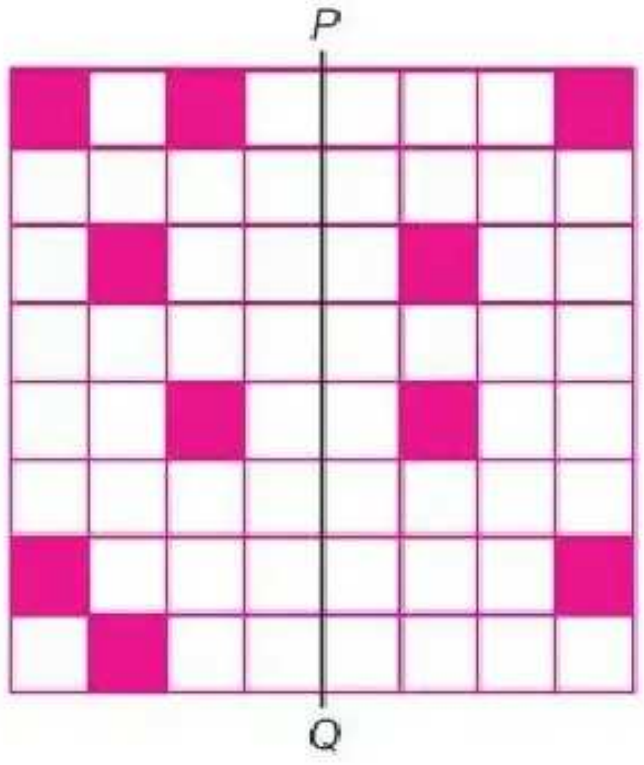
She spent 25% of this money on clothes and saved the rest.

How much money did Saira save?

(A) $375
(B) $350
(C) $150
(D) $125

8

Dani is making a design with PQ as the line of symmetry.

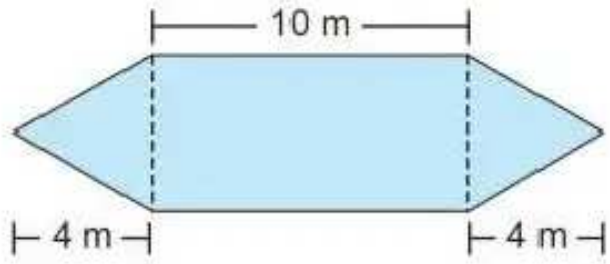


What is the minimum number of squares that Dani still needs to shade?

(A) 2
(B) 3
(C) 4
(D) 5

9

In this shape, the length of the rectangular section is equal to twice the width.

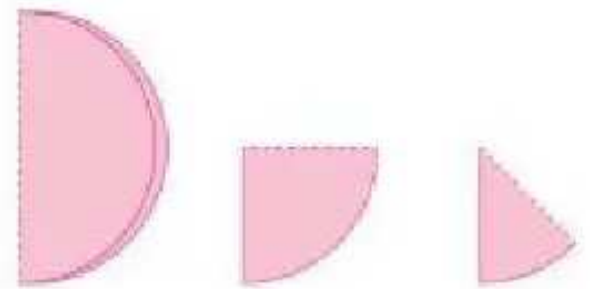


What is the area of the shape?

(A) 90 m^2
(B) 70 m^2
(C) 66 m^2
(D) 56 m^2

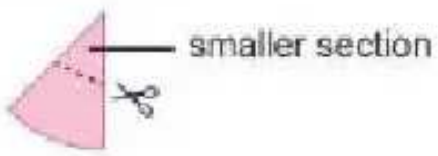
10

Sue took a circular piece of paper and folded it in half three times.



1st fold 2nd fold 3rd fold

She then cut along this dotted line and threw away the smaller section.

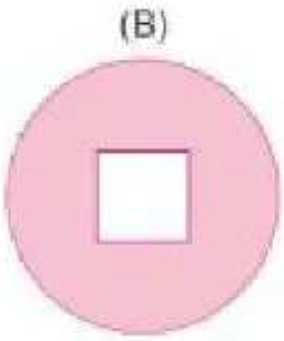


Sue unfolded the remaining piece.

Which of these is the shape of the remaining piece?

(A)

(B)



(C)

(D)

11

This chart shows some information about tides in Sydney for one week in January.

Date	High tides		Low tides	
Jan	Time (am)	Height	Time (pm)	Height
7	6:17	1.3 m	12:22	0.4 m
8	7:14	1.4 m	1:18	0.3 m
9	8:09	1.4 m	2:11	0.1 m
10	9:03	1.4 m	3:03	0.1 m
11	9:56	1.4 m	3:54	0.1 m
12	10:49	1.4 m	4:45	0.1 m
13	11:42	1.4 m	5:36	0.1 m

This table shows the time adjustments for some other coastal towns.

Ballina	+7 minutes
Coffs Harbour	–7 minutes
Port Macquarie	+19 minutes
Bateman's Bay	+3 minutes
Port Kembla	–1 minute

Boats cannot be launched one hour before or after low tide.

Samira wants to launch her boat at Coffs Harbour on the afternoon of 10 January.

Between which times can she **NOT** launch her boat?

(A) 1:56 pm and 3:56 pm
(B) 2:03 pm and 4:03 pm
(C) 2:10 pm and 4:10 pm
(D) 2:47 pm and 4:47 pm

12

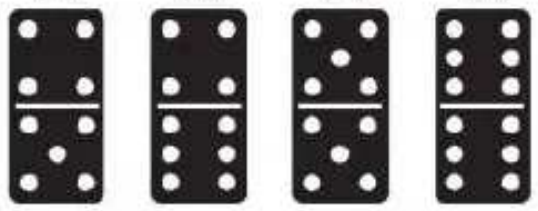
Jane made a pattern with some dominoes.

She arranged them so the dots on the top halves formed one pattern and the dots on the bottom halves formed another pattern.

domino 1 domino 2 domino 3

Which is the next domino in the pattern?

(A) (B) (C) (D)



13

It is now possible to make an artificial arm using a 3-D printer.

This has reduced the cost of an artificial arm from $40 000 to just $400.

What is the new cost as a percentage of the old cost?

(A) 0.01% (B) 0.1%
(C) 1% (D) 10%

14

Mr Goh used this stamp to reward good work.

Which of these shows a print made with this stamp?

(A)

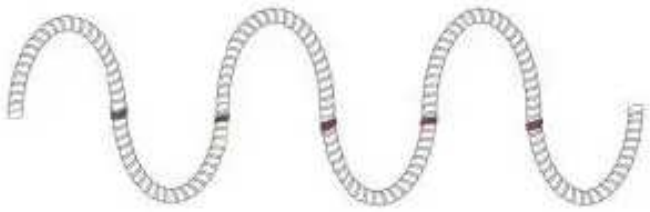
(B)

(C)

(D)

15

Justine had a 120 cm piece of rope with markings every 20 cm.



She cut along one of the markings to form two pieces.

What is the probability that one piece was exactly 40 cm longer than the other piece?

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$

(C) $\frac{1}{5}$ (D) $\frac{2}{5}$

16

Pam climbed 300 steps.
Each step is 20 cm high.

How high did she climb?

(A) 6 m (B) 60 m
(C) 600 m (D) 6000 m

17

A = 1.1 + 2.2 + 3.3 + 4.4

B = 1.1 – 2.2 – 3.3 – 4.4

What is the difference between A and B?

(A) 0 (B) 2.2
(C) 19.8 (D) 22

18

Leanne picked up leaves in the yard.

She filled 20 buckets with leaves.

The average mass of the leaves in the first 12 buckets was 0.4 kg.

The average mass of the leaves in the next 8 buckets was 0.5 kg.

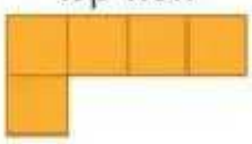
What was the total mass of the leaves in the 20 buckets?

(A) 6.4 kg
(B) 7.0 kg
(C) 8.8 kg
(D) 9.0 kg

19

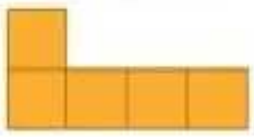
Krish used cubes to build a solid matching these three views.

top view

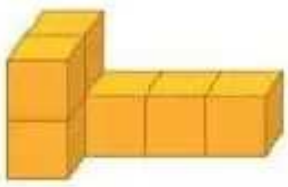


side view

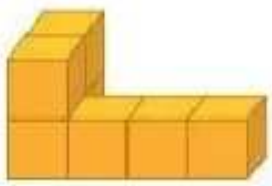
front view



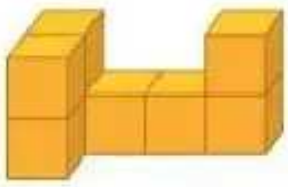
Which of these could be Krish's solid?



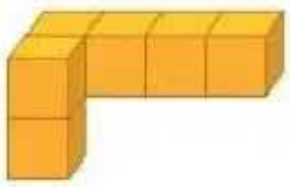
(A)



(B)



(C)



(D)

20

Tina is writing a number pattern.

2, 8, 14, 20, 26, 32, 38 ...

If she continues the pattern, which of these numbers should Tina write?

(A) 138 (B) 144
(C) 152 (D) 160

21

A group of 60 students went to the beach.

Of the 34 students who brought a hat, 25 were boys.

There were 36 boys altogether.

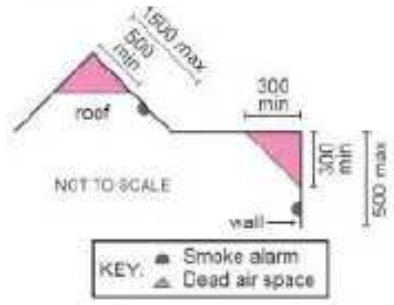
How many girls did not bring a hat?

(A) 9
(B) 15
(C) 24
(D) 26

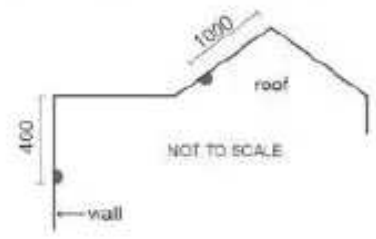
22

Smoke alarms in buildings should not be installed in a corner or 'dead air space'.

The diagram represents the zones within which smoke alarms should be installed. They should be installed between the maximum and minimum distances shown, in mm.



Pete installed two alarms of diameter 80 mm in the positions shown below.



Which option is true for the position of these two alarms?

	Correct position			
Roof	✓	✓	×	×
Wall	✓	×	✓	×
	(A)	(B)	(C)	(D)

23

Sarah is playing a game. She must use the map and the instructions to find the treasure.

Start at the shipwreck on G11.

Travel 1 kilometre south.

Turn west and travel 750 metres.

Next, turn south and travel 500 metres.

Finally, turn east and travel 250 metres.

The treasure is buried there.

Where is the treasure buried?

(A) I5
(B) H4
(C) F5
(D) E5

24

The school sports organiser ordered 15 buses to transport 750 students to the carnival.

There were 2 supervising teachers on each bus.

Each bus had seats for 53 passengers.

How many spare seats were there altogether?

(A) 15 (B) 30
(C) 45 (D) 75

25

This is a pallet. It has a mass of 25 kilograms (kg).

Fiona places 150 tiles on the pallet.

A stack of 4 tiles has a mass of 5 kg.

What is the total mass of the pallet and the tiles?

(A) 775 kg (B) 212.5 kg
(C) 187.5 kg (D) 145 kg

26

Jai had 69 picture cards including 15 pairs and 9 triples. A pair is two of the same kind of card. A triple is three of the same kind of card.

He kept one of each kind of card and gave the rest away.

How many cards did he keep?

(A) 36
(B) 45
(C) 51
(D) 57

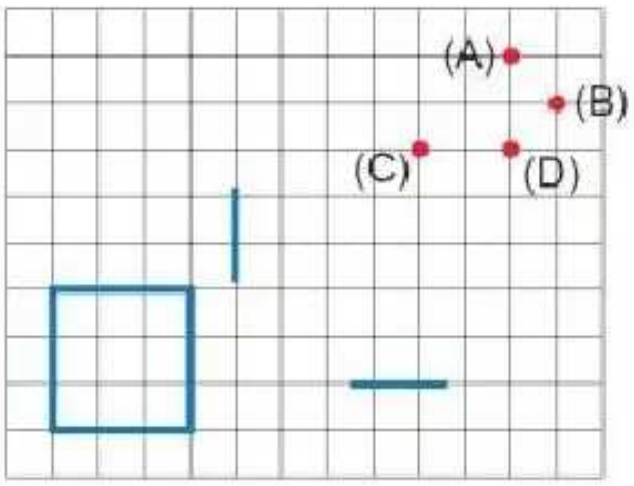
27

Chen drew a square on a grid.

Then he started to draw a second square with a side length double that of the first square.

Two parts of the second square are shown on the grid.

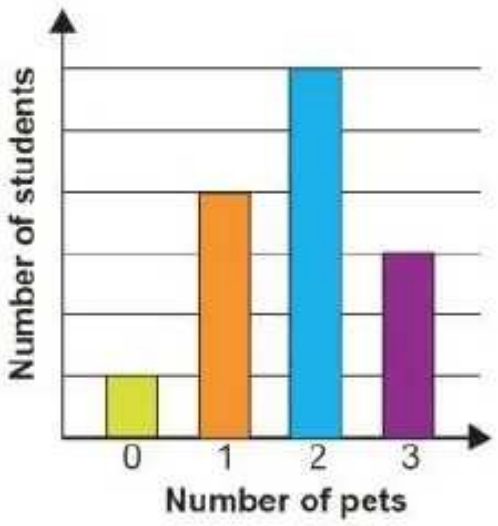
Which dot will lie on one of the sides of the second square?



28

Jackie asked students in Year 7 how many pets they own.

She graphed her results.



Nine students each own three pets.

How many pets do the students own in total?

(A) 14
(B) 42
(C) 50
(D) 75

29

The houses on one side of Acacia Street have consecutive odd numbers.

Jim lives in house number 83 and Marni lives in house number 15.

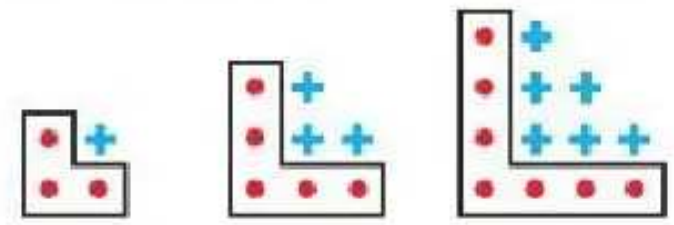
Clive lives in the house with the number exactly halfway between 15 and 83.

How many houses along from Marni, is Clive's house?

(A) 17 (B) 25
(C) 34 (D) 49

30

Adam is making a pattern of shapes.

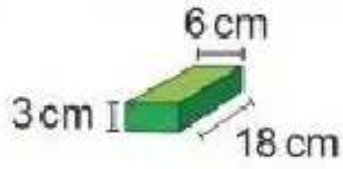


What should be the total number of spots and crosses in shape 6?

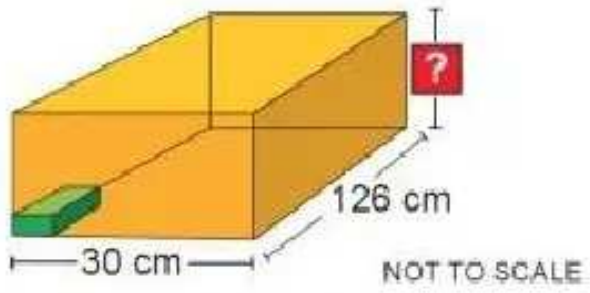
(A) 34 (B) 32
(C) 28 (D) 26

31

Kim has 280 of these small green boxes.



They completely fill this large yellow box.



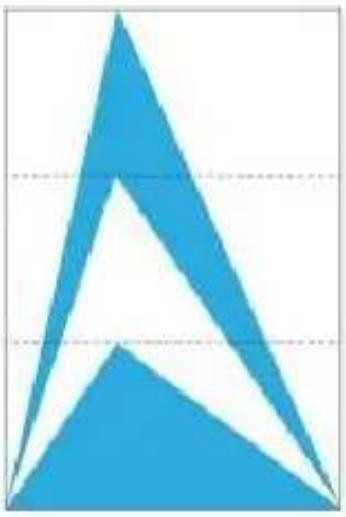
What is the height of the yellow box?

(A) 27 cm (B) 24 cm
(C) 21 cm (D) 15 cm

32

Carly had a rectangular piece of cardboard, 5 cm wide, with an area of 60 cm^2 on which to design a poster for a climbing group.

Carly folded the cardboard into thirds. Then she drew three overlapping triangles with a shared base.



What is the total area of the blue shaded regions?

(A) 40 cm^2 (B) 30 cm^2
(C) 20 cm^2 (D) 10 cm^2

33

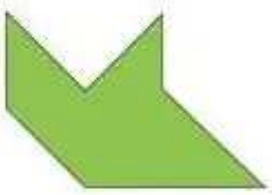
Ron has these 3 shapes.

He joins all of the shapes together, without any overlap, to make a new shape.

Which of these could be Ron's new shape?

(A)

(B)



(C)

(D)

34

Mrs Brown measured the heights of all 25 children in her class to the nearest cm.

Matthew and Lin made different tables to record these heights.

Mathew's Table

Height (cm)	Number of children
151 – 155	5
156 – 160	9
161 – 165	7
166 – 170	4

Lin's Table

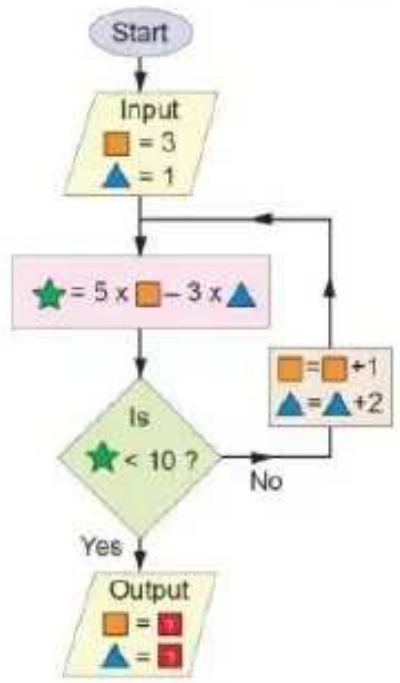
Height (cm)	Number of children
145 – 154	2
155 – 164	18
165 – 174	5

How many children in the class have a height greater than 154 cm but less than 166 cm?

(A) 17 (B) 18
(C) 19 (D) 20

35

George is using this flowchart. He inputs two values and follows the rules.



What are the output values?

	□	△
(A)	4	3
(B)	5	5
(C)	6	7
(D)	7	9

36

Mark and Kate each think of a different 2-digit number between 10 and 60.

Kate multiplies her number by 7 and then subtracts 42.

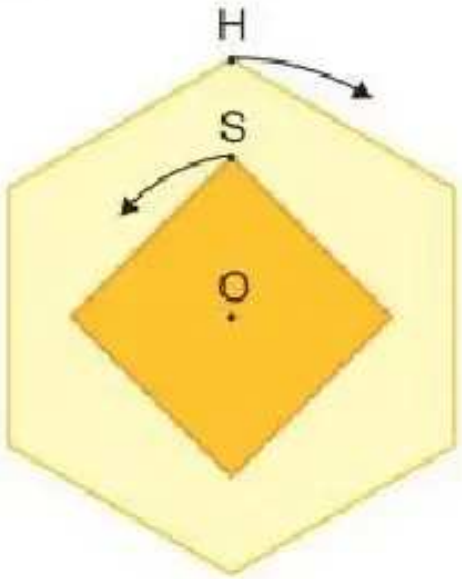
Mark divides his number by 8 and then adds 42.

They both get the same answer.

What is the sum of their original numbers?

37

A square cog and a regular hexagonal cog are both rotating about a common centre, O.



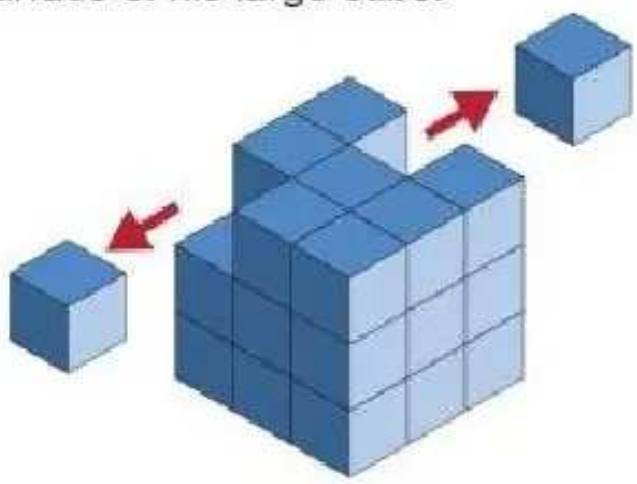
At each click, the hexagon rotates 60° clockwise, and the square rotates 90° anticlockwise.

Initially, the vertices H and S and centre O lie in the same straight line as shown.

How many clicks does the hexagonal cog make before the vertices H and S first return together to their original position?

38

John made a large cube using 27 identical smaller cubes. There were 54 square faces of the smaller cubes showing on the surface of his large cube.



John removed two of the cubes to make a new solid.

How many square faces of the smaller cubes could John see on his new solid?

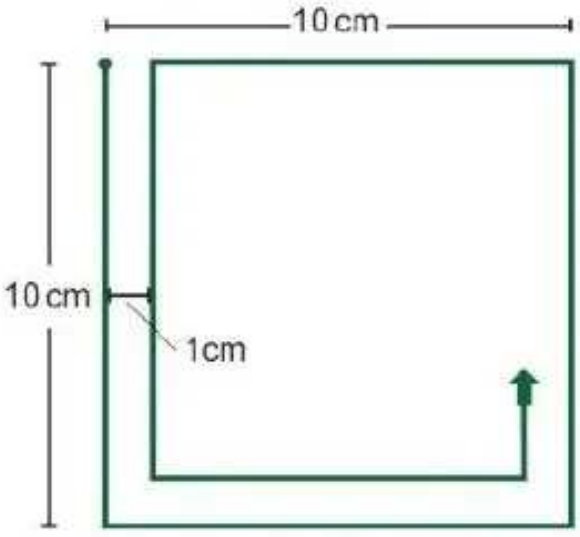
39

Ella is using a drawing program on her computer.

She wants to draw a spiral to fill a square of side length 10 cm.

Ella programs the computer to

- start in the top left corner
- move anticlockwise around the edges of the square
- maintain a distance of 1 cm from an existing line, as shown.



What is the total length of all the lines drawn by the computer, in cm?

40

Raj and Jess live on the same long road.

Jess left her home and rode her bike along the road at a constant speed of 18 km/h.

Raj left his home 10 minutes after Jess. He drove his car in the same direction as Jess rode.

Raj overtook Jess after driving for 40 minutes at a constant speed of 75 km/h.

How many kilometres from Jess does Raj live?