ICAS.

PAPER

F

2020 MATHEMATICS

TIME ALLOWED: 1 HOUR

ICAS assessments

This picture shows an airport departure screen.

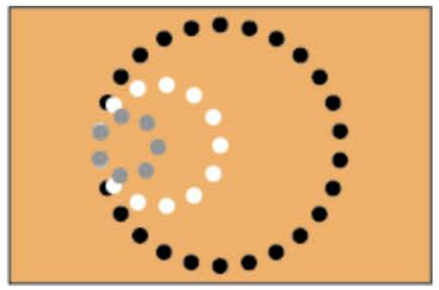
Time	Flight	Destination	Gate
10:10	F147	Singapore	L
10:20	F852	Hong Kong	R
10:30	F639	Beijing	L
10:40	F025	Tokyo	R
10:50	F986	Sydney	L

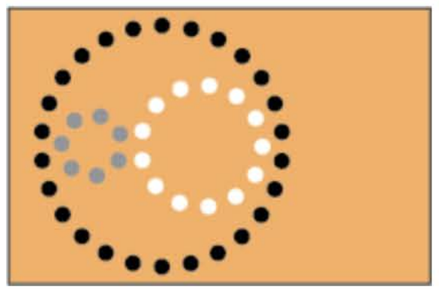
Which flight leaves 20 minutes before flight F639?

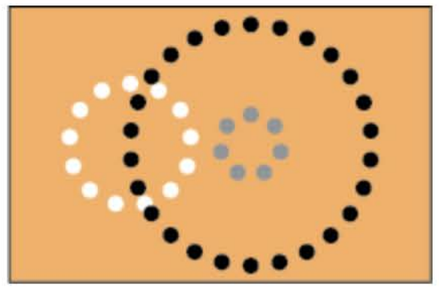
- [ ] F025
- [ ] F147
- [ ] F852
- [ ] F986

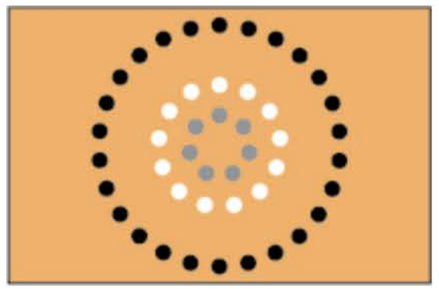
Helen made a design for her art folder. She drew three circles, each made of dots. The three circles had the same centre.

Which of these is her design?

☐ 

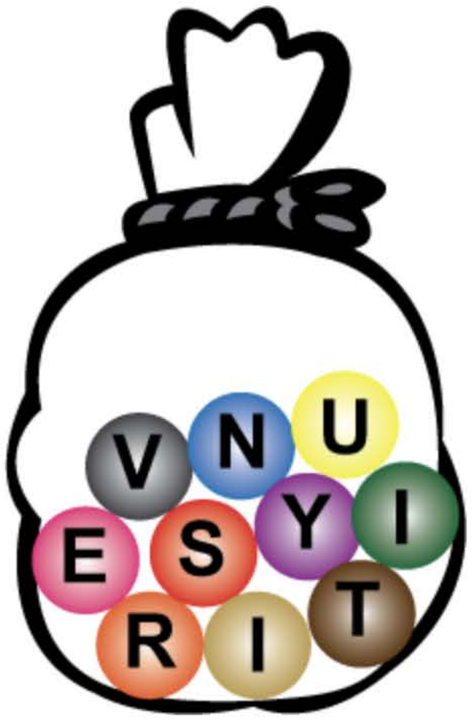
☐ 

☐ 

☐ 

Chelsea wrote each letter of the word 'UNIVERSITY' on identically sized balls.

She put the balls in a bag and asked James to choose one without looking.



What is the chance that James will choose a ball with the letter 'I' on it?

- [ ] 0.1
- [ ] 0.2
- [ ] 0.3
- [ ] 0.5

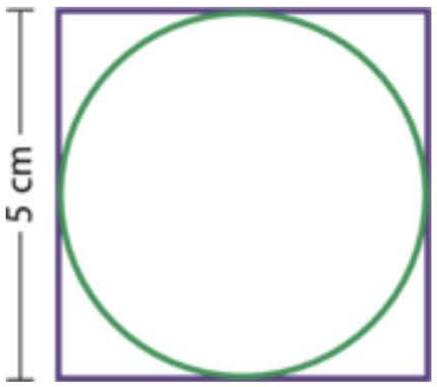
Roger had x bottles for recycling.

His father gave him x more bottles, and his mother gave him y bottles.

How many bottles did Roger have altogether?

- ☐ $x + y$
- ☐ $x^2 + y$
- ☐ $2x + y$
- ☐ $x^2 y$

The perimeter of this square is 20 cm.



Which of these is the best estimate for the perimeter of the circle?

- [ ] 20 cm
- [ ] 15 cm
- [ ] 10 cm
- [ ] 5 cm

The table below shows the average temperature in five cities for one day.

City	Average Temperature / °C
A	8
L	20
O	- 4
S	12
T	- 12

Which city's average temperature was 12 °C colder than *A*'s average temperature?

- [ ] *L*
- [ ] *O*
- [ ] *S*
- [ ] *T*

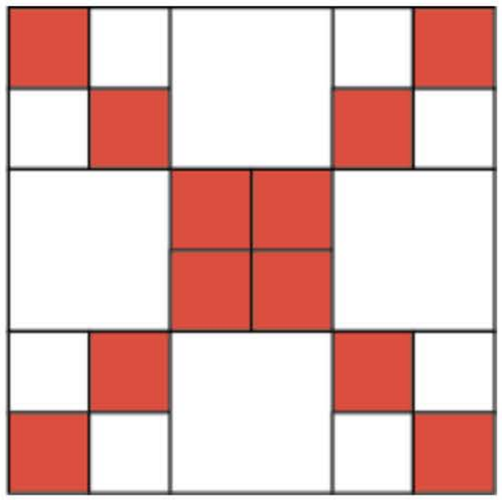
Tony is writing a number pattern.

2, 8, 14, 20, 26, 32, 38, …

If he continues the pattern, which of these numbers should Tony write?

- [ ] 138
- [ ] 144
- [ ] 152
- [ ] 160

Mary used 4 large square tiles and 20 small square tiles to make this design.

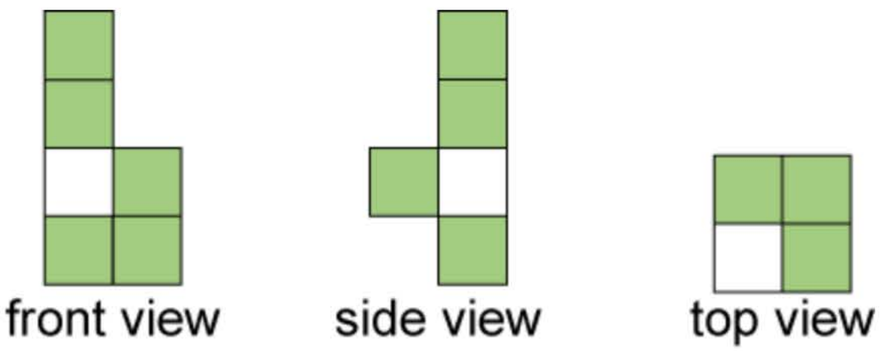


What fraction of her design is shaded?

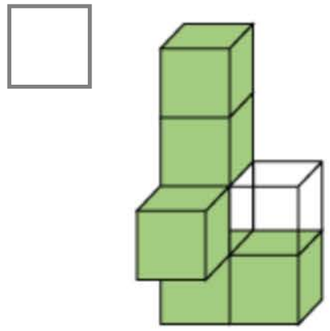
- ☐ $\frac{1}{5}$
- ☐ $\frac{1}{4}$
- ☐ $\frac{1}{3}$
- ☐ $\frac{1}{2}$

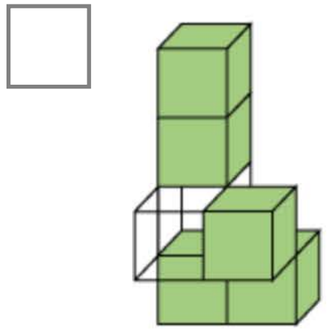
A solid is made out of seven blocks, two of which are clear plastic.

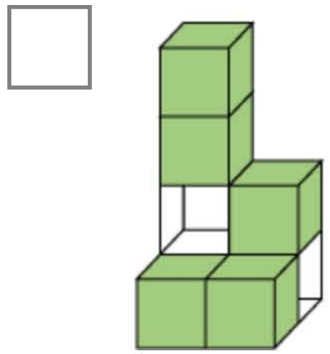
Here are three views of the solid.

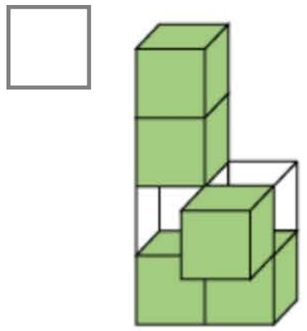


Which of these is the solid?





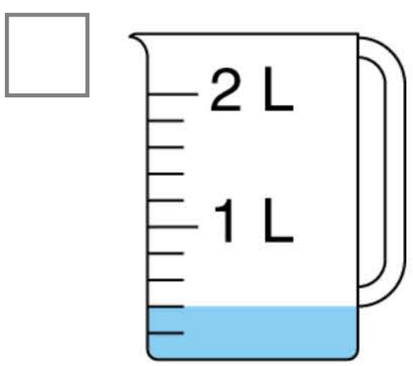


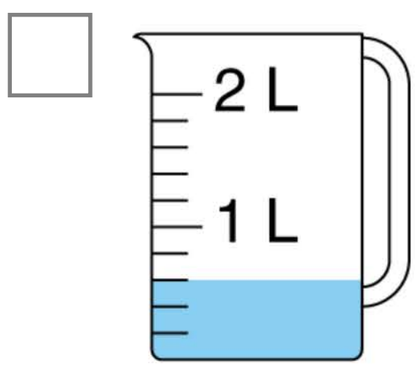


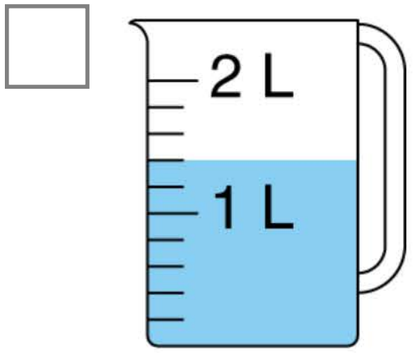
Charles wants to fill four identical containers with 2 litres of water.

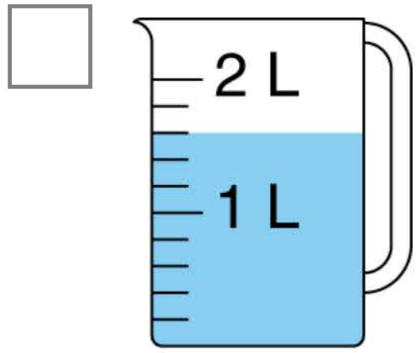
There is already some water in each container.

Into which container must he pour 1400 millilitres of water to make it up to 2 litres?

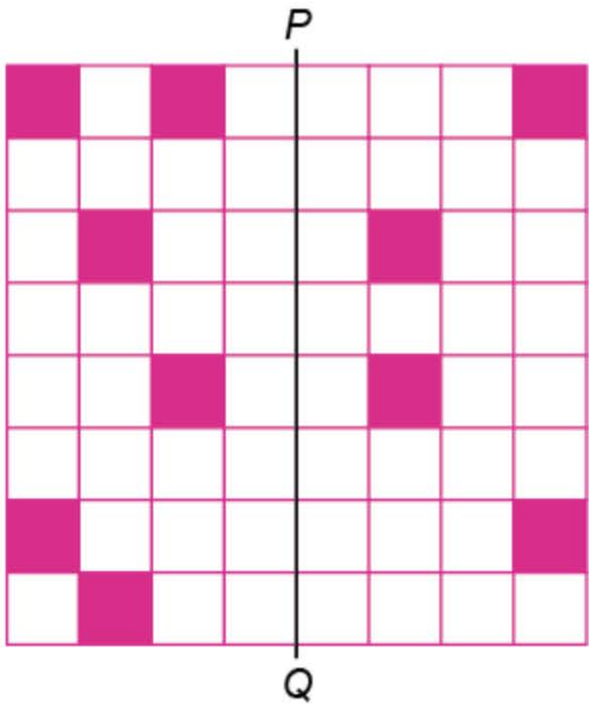








Dani is making a design with *PQ* as the line of symmetry.



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

- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

Jackson bought 2 packets of balloons. Each packet contained 15 balloons.

6 friends came to his party. Jackson shared all the balloons equally between himself and his friends.

What is the least number of balloons that were left over?

- [ ] 0
- [ ] 1
- [ ] 2
- [ ] 3

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?

- ☐ 6.4 kg
- ☐ 7.0 kg
- ☐ 8.8 kg
- ☐ 9.0 kg

A second-hand car was advertised for $3000.

Max bought the car and received a discount of 30%.

How much did Max pay for the car?

- [ ] $900
- [ ] $1000
- [ ] $2000
- [ ] $2100

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

How high did she climb?

- [ ] 6 m
- [ ] 60 m
- [ ] 600 m
- [ ] 6000 m

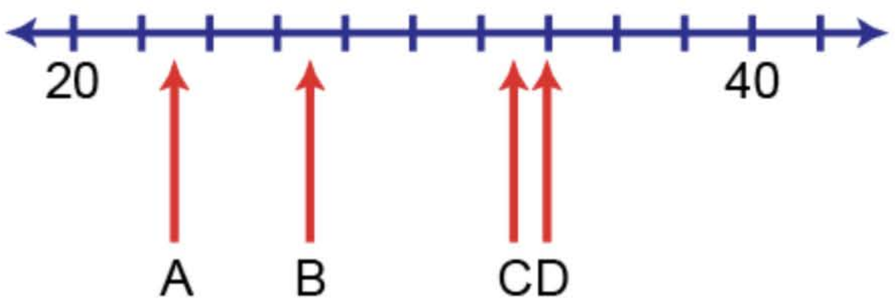
Tina created this number pattern.

$5\frac{1}{3}$, $2\frac{2}{3}$, $1\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{3}$, ?

What should ? be?

- ☐ $-\frac{2}{3}$
- ☐ $-\frac{1}{3}$
- ☐ $\frac{1}{6}$
- ☐ $\frac{1}{9}$

Which arrow is closest to 3^3 on the number line shown?



- [ ] A
- [ ] B
- [ ] C
- [ ] D

Mark swims laps at the pool each afternoon after school. Every day he records the time he took to swim one lap.

The table shows his results for last week.

Mon	58 seconds
Tue	1 minute 2 seconds
Wed	1 minute 4 seconds
Thu	58 seconds
Fri	56 seconds

What is the mean of Mark's swimming times, rounded to 1 decimal place?

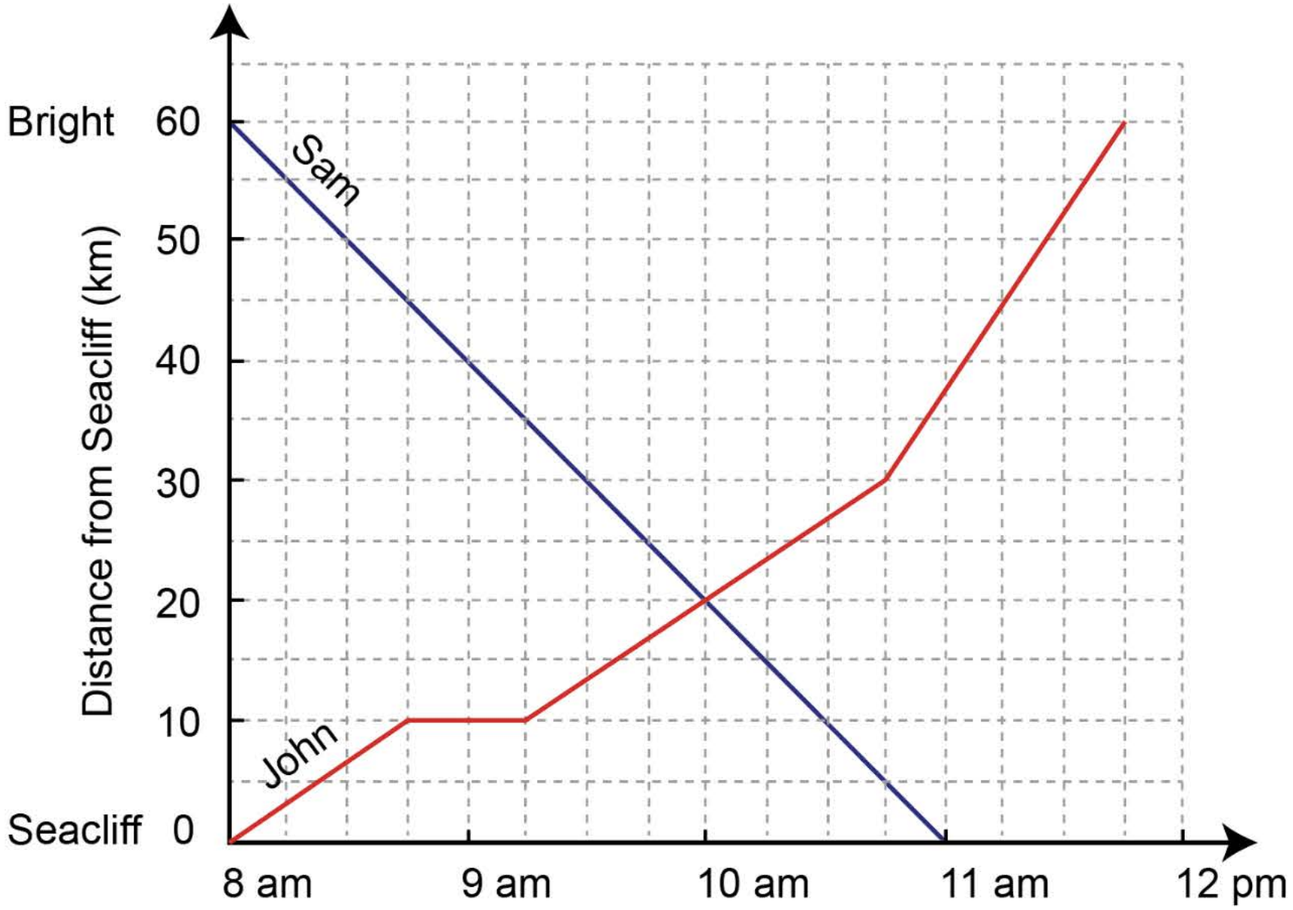
[ ] seconds

$$\frac{27}{40} < \frac{?}{90} < \frac{49}{72}$$

Which number will make this expression correct?

- [ ] 38
- [ ] 46
- [ ] 61
- [ ] 70

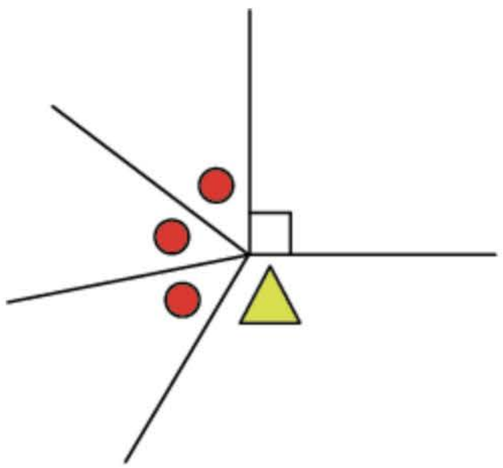
John cycles from Seacliff to Bright while Sam cycles from Bright to Seacliff. They both cycle on the same road.



How many kilometres are they from **Bright** when they pass each other?

[ ] km

In this diagram, ● + ● = △.

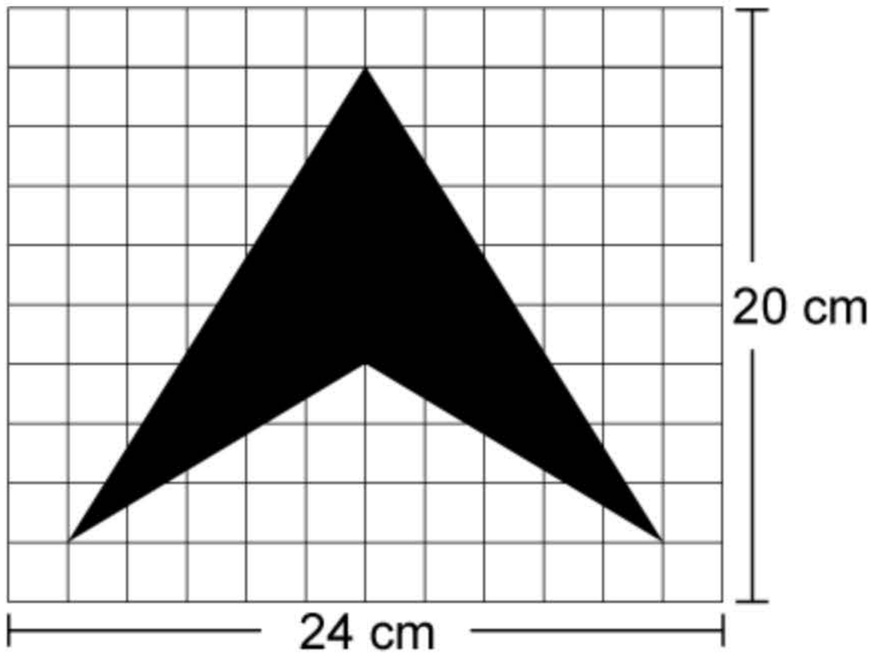


NOT TO SCALE

What angle is represented by △?

- ☐ 72°
- ☐ 100°
- ☐ 108°
- ☐ 120°

Sharon is designing a logo. She draws a plan for her logo on grid paper.



What is the area of the shaded region, in cm^2?

- ☐ 60
- ☐ 90
- ☐ 100
- ☐ 160

Oscar, Lily and Jack collect souvenir coins.

Oscar has 44 more coins than Lily and 48 more coins than Jack.

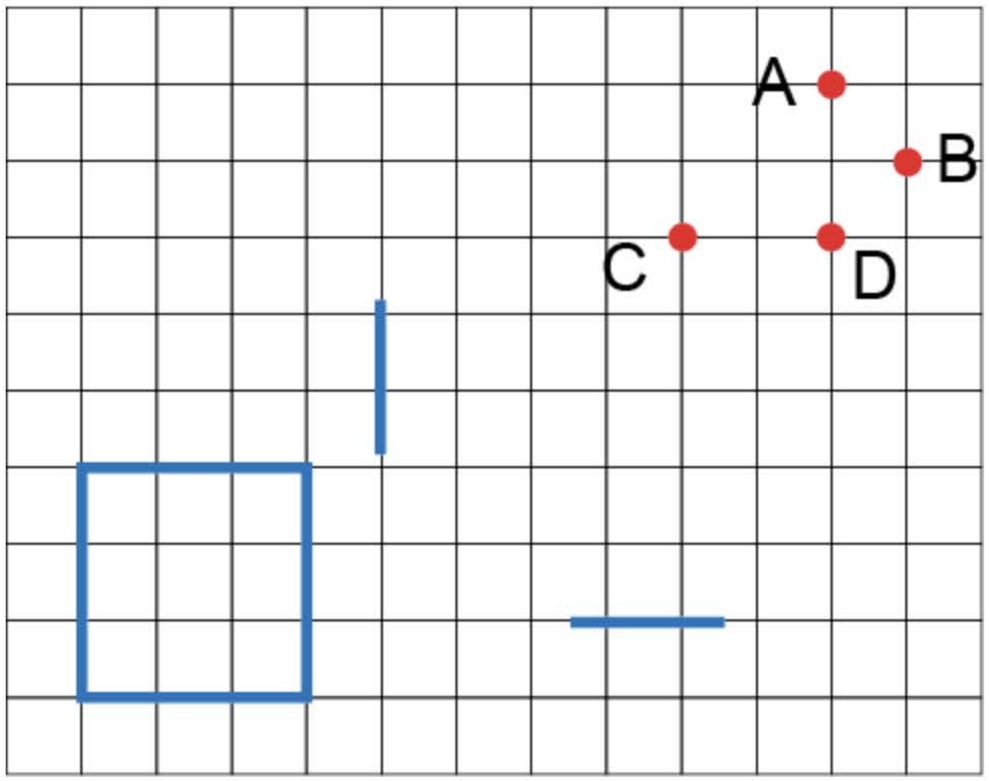
Oscar has 6 more coins than Lily and Jack combined.

How many coins do Oscar, Lily and Jack have altogether?

- [ ] 196
- [ ] 166
- [ ] 156
- [ ] 146

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.

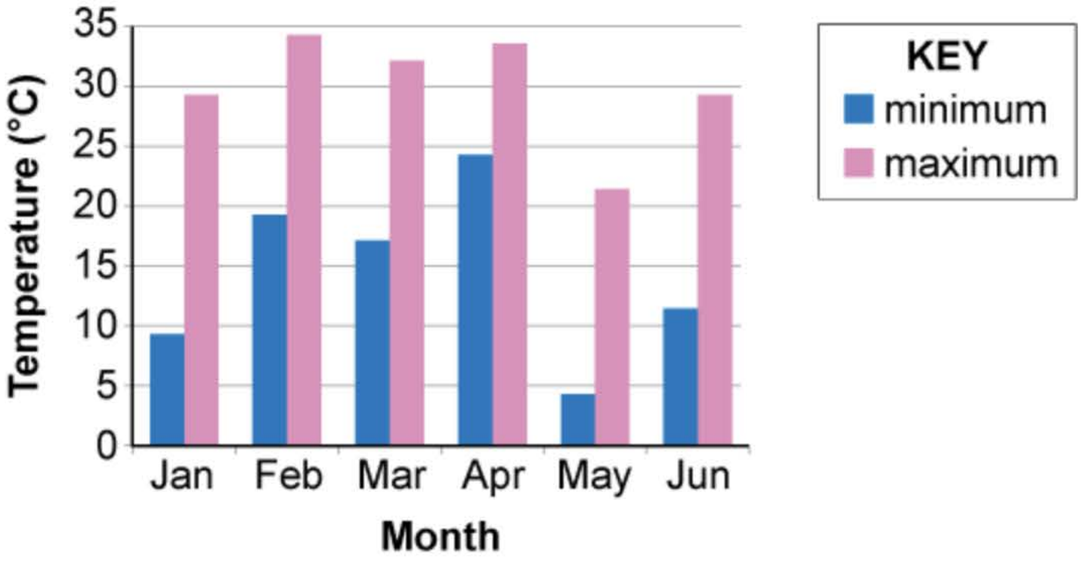
Two parts of the second square are shown on the grid.



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

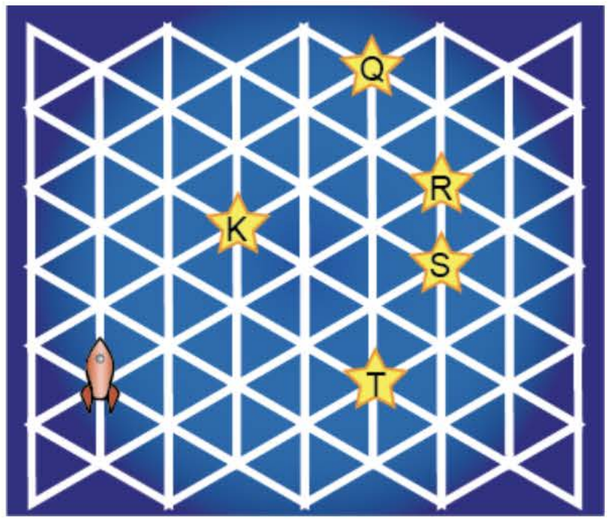
- [ ] A
- [ ] B
- [ ] C
- [ ] D

The column graph shows the minimum and maximum temperatures in Anyland for six months.



Which month has the greatest range in temperature?

- [ ] Jan
- [ ] Feb
- [ ] May
- [ ] Jun



Sally is playing a game on this board.

In the game the spaceship visits stars by moving along the white lines.

Sally moves the spaceship to K using these instructions:

- Turn clockwise 60°
- Move forward 2 units
- Turn anticlockwise 60°
- Move forward 1 unit.

Sally then moves the spaceship from K using these instructions:

- Turn anticlockwise 240°
- Move forward 2 units
- Turn clockwise 300°
- Move forward 1 unit.

At which star does the spaceship finish?

☐ Q ☐ R ☐ S ☐ T

In some countries, long distances are measured in miles instead of kilometres.

This formula can be used to give an approximate conversion between kilometres K and miles M.

$$5 \times K = 8 \times M$$

Using this formula, approximately how far is 40 miles in kilometres?

- ☐ 25
- ☐ 40
- ☐ 64
- ☐ 1600

Jia is placing each of the numbers from 1 to 9 in separate cells on the grid.

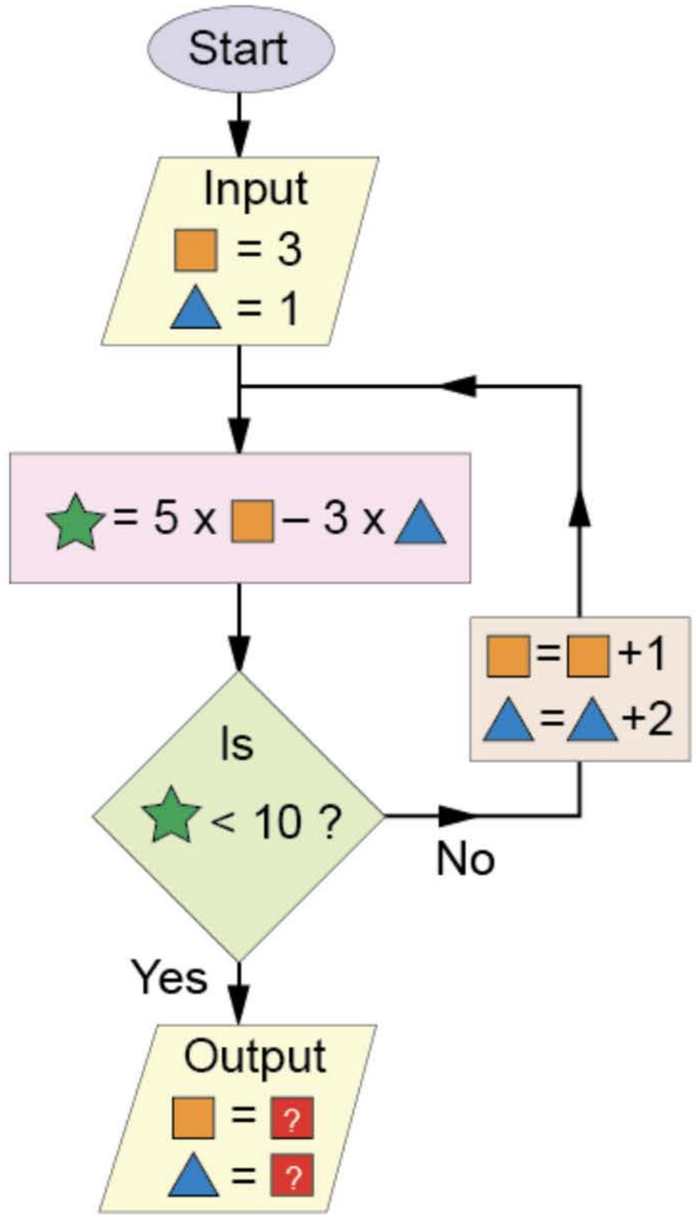
She starts with 3 as this number is both prime and triangular.

	Prime	Square	> 5
Even			
Triangular	3 		
Odd			

What answer should Jia get when she adds the numbers in the shaded diagonal?

- [ ] 18
- [ ] 15
- [ ] 12
- [ ] 10

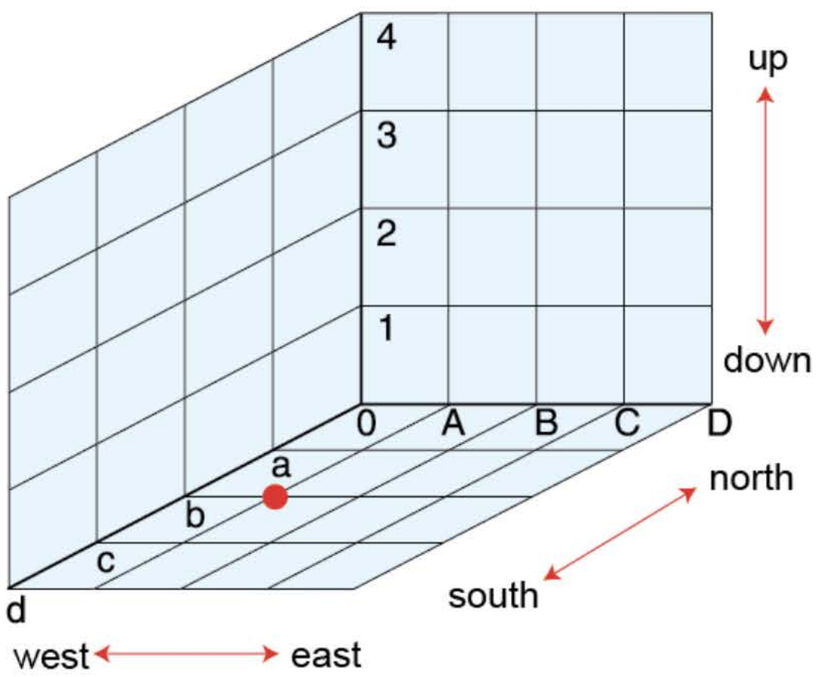
Grace is using this flowchart. She inputs two values and follows the rules.



What are the output values?

- □ = 4, △ = 3
- □ = 5, △ = 5
- □ = 6, △ = 7
- □ = 7, △ = 9

Jade and Bruce are playing a 3-dimensional game of air battles. Jade is flying an aircraft in this 3-dimensional airfield. Bruce tries to shoot down Jade's aircraft by firing at specific coordinates.



Jade's aircraft starts at coordinates A0b, as shown in the diagram. She then moves:

- 3 spaces up,
- 2 spaces south,
- 2 spaces east,
- 1 space down,
- 3 spaces north.

What coordinates does Bruce need to fire at in order to shoot down Jade's aircraft at her final destination?

- [ ] A1d
- [ ] B2a
- [ ] C1c
- [ ] C2a

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's is Clive's house?

- [ ] 17
- [ ] 25
- [ ] 34
- [ ] 49

In 15 years' time, Janice will be twice as old as she was 25 years ago.

How old is Janice now?

☐ years old

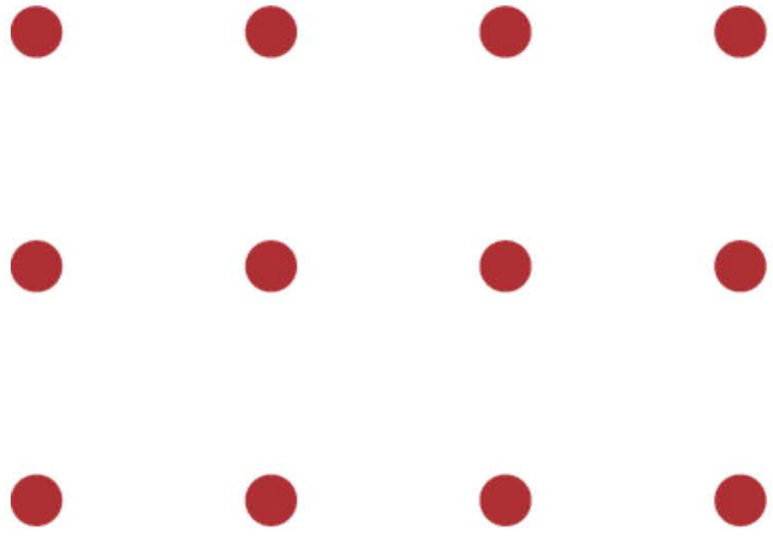
A rectangular painting has an area of 2.43 square metres. The length of the painting is three times the width.

NOT TO SCALE

What is the length of the painting?

- [ ] 0.27 metres
- [ ] 0.81 metres
- [ ] 0.90 metres
- [ ] 2.7 metres

Audrey drew 16 dots on her page. Each dot is the same distance from the dots above, below and to the side of it.



To draw a square, Audrey must use a dot for each corner.

How many squares can she draw?

- [ ] 10
- [ ] 14
- [ ] 18
- [ ] 20
- [ ] 22

There are 9 people in a room.

Each person shakes hands once with every other person in the room.

How many handshakes are there all together?

- ☐ 18
- ☐ 36
- ☐ 45
- ☐ 72

A magnetic toy is made of identical metal balls and plastic sticks that join using magnets.

The mass of 3 sticks and 2 balls is 285 g.

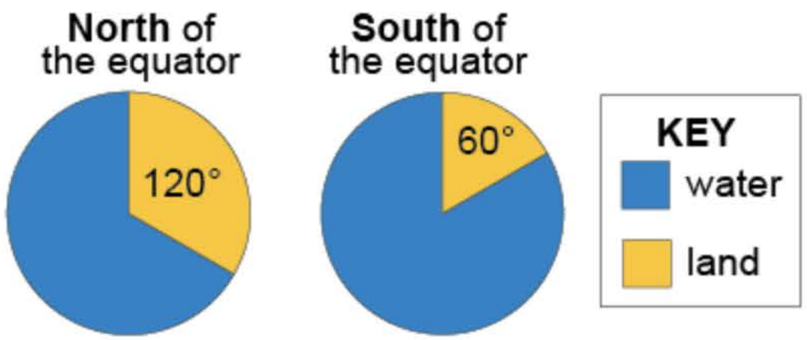
The mass of 7 sticks and 5 balls is 685 g.

What is the mass of 1 stick and 1 ball?

[ ] g

The surface of Earth is covered by water and land.

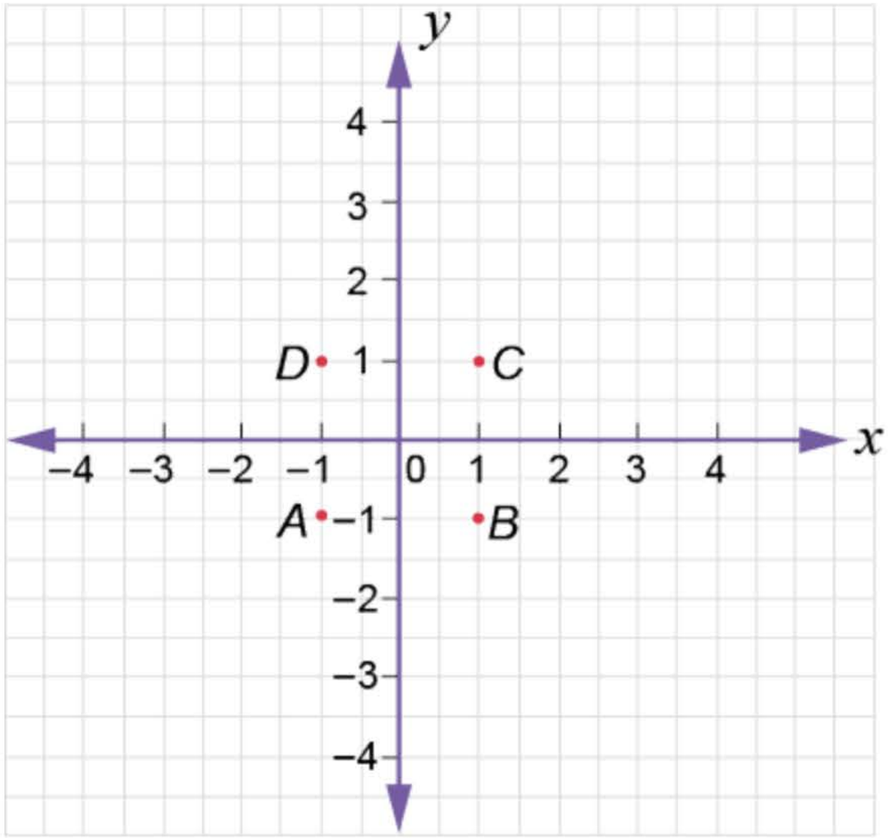
Li drew two sector graphs to show the proportion of water and land in each hemisphere.



According to Li's graphs, what fraction of Earth's surface is covered by water?

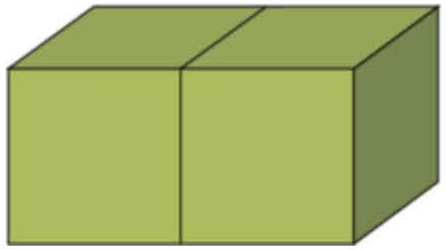
- ☐ $\frac{3}{4}$
- ☐ $\frac{7}{10}$
- ☐ $\frac{5}{9}$
- ☐ $\frac{1}{2}$

Which of the following points lies on the line $y = -x - 2$?



- [ ] A
- [ ] B
- [ ] C
- [ ] D

Two cubes are glued together to make a rectangular prism.

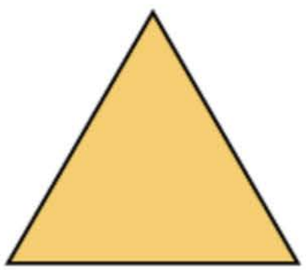


The sum of the lengths of the edges of the rectangular prism is 240 cm.

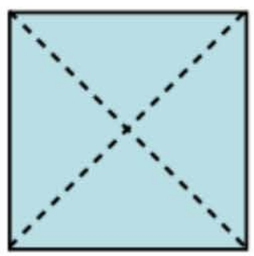
What is the volume of the rectangular prism?

- ☐ 6750 cm^3
- ☐ 3456 cm^3
- ☐ 3375 cm^3
- ☐ 2000 cm^3

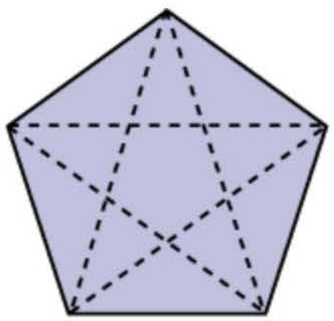
A regular polygon is a shape with straight sides all the same length. The diagram shows the diagonals of four such polygons.



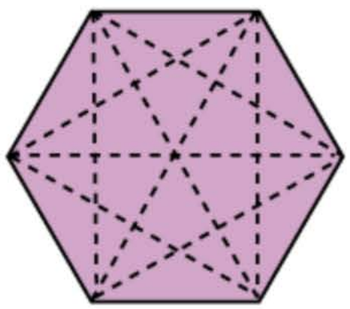
sides = 3
diagonals = 0



sides = 4
diagonals = 2



sides = 5
diagonals = 5



sides = 6
diagonals = 9

How many diagonals would a regular polygon with 15 sides have?

Results

Question number	Correct answer	Mark	Category	Descriptor
1	B		Measures & Units	Identify the correct airplane flight using a time difference
2	D		Space & Geometry	Identify a pattern that satisfies a set of conditions
3	B		Chance & Data	Find the probability of a simple event
4	C		Algebra & Patterns	Create an algebraic expression involving the addition of two unknowns
5	B		Measures & Units	Estimate the perimeter of a circle given the perimeter of a square around it
6	B		Number & Arithmetic	Choose the city that has a given temperature difference to another city
7	C		Algebra & Patterns	Identify a large number that fits into a linear pattern
8	C		Number & Arithmetic	Calculate the fraction of a shaded region
9	B		Space & Geometry	Recognise a 3D shape from the front, side and top views
10	B		Measures & Units	Read a scale to identify the container that will hold a given volume of liquid
11	C		Space & Geometry	Add the minimum number of squares to make a design with line symmetry
12	C		Number & Arithmetic	Solve a problem using multiplication, division and subtraction
13	C		Measures & Units	Calculate a total mass given average masses
14	D		Number & Arithmetic	Calculate a discounted price
15	B		Measures & Units	Solve a problem involving the conversion of units
16	C		Algebra & Patterns	Find the next number in a fractional sequence
17	B		Number & Arithmetic	Locate the position of 3 cubed on a number line
18	59.6		Chance & Data	Find the mean of a set of times
19	C		Number & Arithmetic	Find the numerator of a fraction given limits
20	40		Algebra & Patterns	Interpret an authentic travel graph
21	C		Space & Geometry	Calculate the magnitude of an angle given a right angle and angles at a point
22	C		Measures & Units	Calculate the area of a shaded region using a grid
23	B		Number & Arithmetic	Solve a complex word problem
24	D		Space & Geometry	Apply an enlargement transformation to a square on a grid
25	A		Chance & Data	Interpret a column graph to calculate the range
26	C		Space & Geometry	Move an object on a grid by following instructions
27	C		Algebra & Patterns	Substitute a value into a formula and solve the resulting equation
28	D		Number & Arithmetic	Solve a magic square by placing the digits according to specific number properties
29	C		Algebra & Patterns	Use a flowchart and use substitution to find two output values
30	D		Space & Geometry	Follow a set of instructions to locate a point in a 3D coordinate system

Results

Question number	Correct answer	Mark	Category	Descriptor
31	A		Number & Arithmetic	Solve a multi-step problem involving odd numbers
32	65		Algebra & Patterns	Calculate a person's age given certain conditions
33	D		Measures & Units	Find the length of a rectangle given the area and the relationship between the sides
34	D		Space & Geometry	Determine the maximum number of squares that can be drawn on a grid
35	B		Chance & Data	Determine the number of possible outcomes for a situation
36	115		Algebra & Patterns	Calculate the weight of different objects using algebraic techniques
37	A		Chance & Data	Interpret a sector graph in a real-world context
38	A		Algebra & Patterns	Select a point that lies on a given equation
39	A		Measures & Units	Find the volume of a square prism given the sum of its edges
40	90		Algebra & Patterns	Find the number of diagonals in a given polygon

You have completed this practice test.

Your mark is 0 / 40 0%

Click here to reset the test and try again.

ICAS.