ICAS.

PAPER

D

# 2020 MATHEMATICS

**TIME ALLOWED: 1 HOUR**



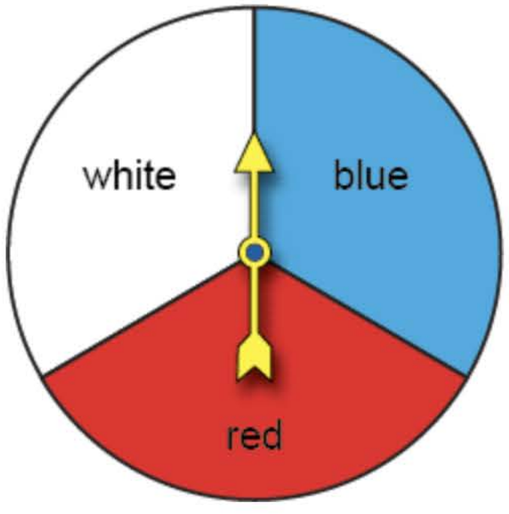
ICAS assessments

Butterflies are symmetrical.

Here is a picture of half a butterfly.

Which of these is the other half of this butterfly?

Donald has this spinner.




When he spins it, what is the chance that it lands on blue?

- [ ] unlikely
- [ ] likely
- [ ] even
- [ ] certain

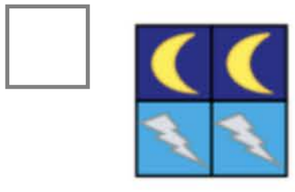
Richard has 68 cards. Anna has 14 cards.

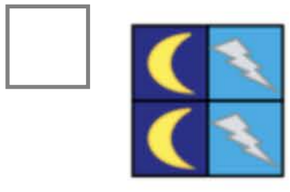
How many cards must Richard give Anna so that they have the same number of cards?

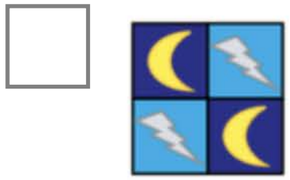
- [ ] 54
- [ ] 41
- [ ] 34
- [ ] 27

A part of this pattern is missing.


Which picture shows the missing part?







Mr Lee had 10 apples.

He cut each apple into quarters and gave an equal number of quarters to his 5 children.

How many apple quarters did each child get?

- [ ] 8
- [ ] 5
- [ ] 4
- [ ] 2

How many 4-digit numbers contain only the digits 2 and 0?

- [ ] 6
- [ ] 7
- [ ] 8
- [ ] 9
- [ ] 10

Romesh wrote down the number 12 and a smaller number.

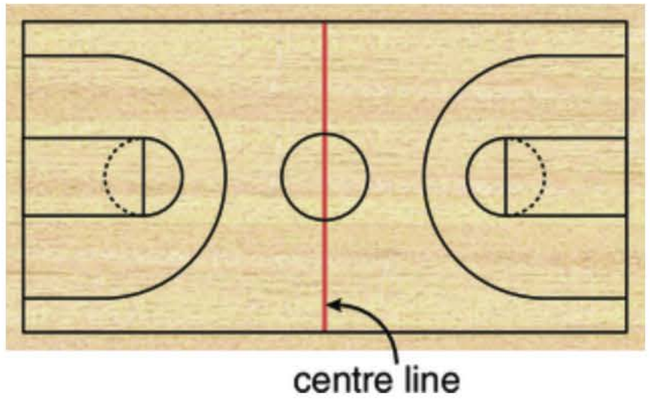
He found the difference between these two numbers.

Romesh then doubled this difference. This answer was the same as the sum of the two numbers.

What was the smaller number?

- [ ] 4
- [ ] 6
- [ ] 8
- [ ] 10

This is a drawing of a basketball court.




How many black lines in this drawing are parallel to the red centre line?

- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

$30 \div 5 = 2 \times$ ?

What must ? be?

- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 6

Four students compared their results in a music exam.

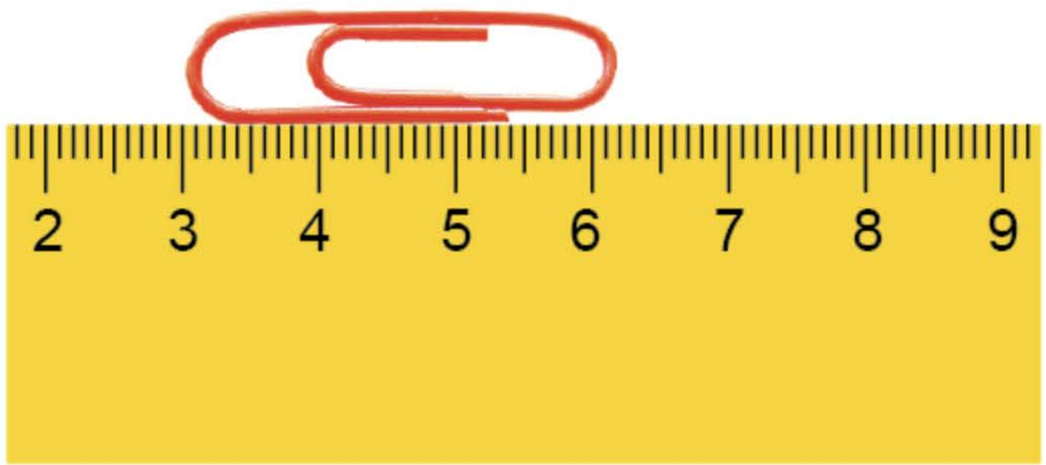
All 30 questions were worth 1 mark each.

- Sue answered 3 out of every 5 questions correctly.
- Amy's score rounded to 63%.
- Jim made 12 errors.
- Peter answered 20 correctly.

Which statement is true?

- [ ] Peter did better than Sue.
- [ ] Sue did better than Amy.
- [ ] Amy did better than Peter.
- [ ] Jim did better than Amy.

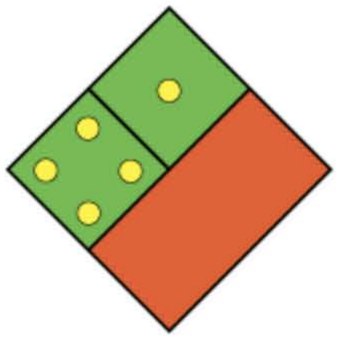
Amanda is measuring a paperclip using a ruler marked in centimetres.




How long is the paperclip, in centimetres?

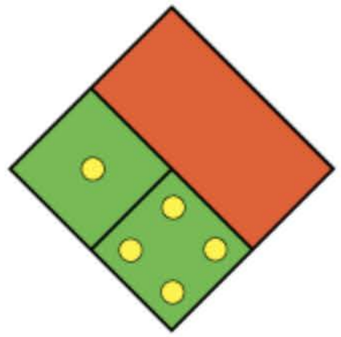
- [ ] 6.2
- [ ] 4.2
- [ ] 3.2
- [ ] 3

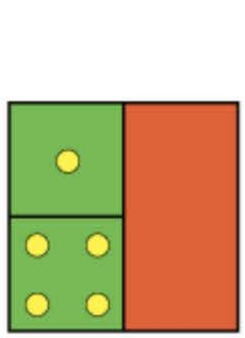
Raj drew this shape.

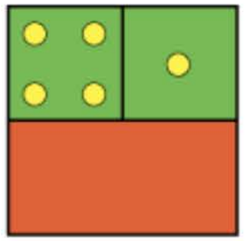


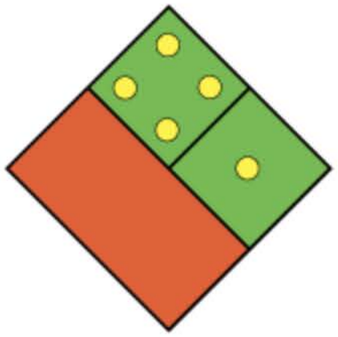
Raj rotated it anticlockwise by a quarter of a turn.

Which of these shows the shape after this rotation?









Which number is between 6.9 and 9.6?

- [ ] 9.96
- [ ] 6.69
- [ ] 9.69
- [ ] 6.96

Ms Clark asked 36 students to choose between ball games and computer games.

She started to put her results in a table.

| | Preferred game | | |
|---|---|---|---|
| | Computer | Ball | |
| Boys | 9 | | |
| Girls | | ? | 21 |
| | | 19 | |

How many girls preferred ball games?

- [ ] 8
- [ ] 10
- [ ] 11
- [ ] 13

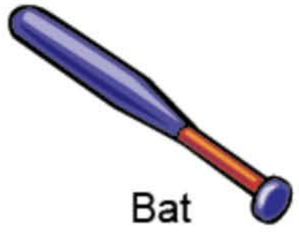
Pete wants to post presents to his son for his birthday.

He can choose from these items.

Baseball
150 grams

Helmet
1450 grams

Glove
390 grams

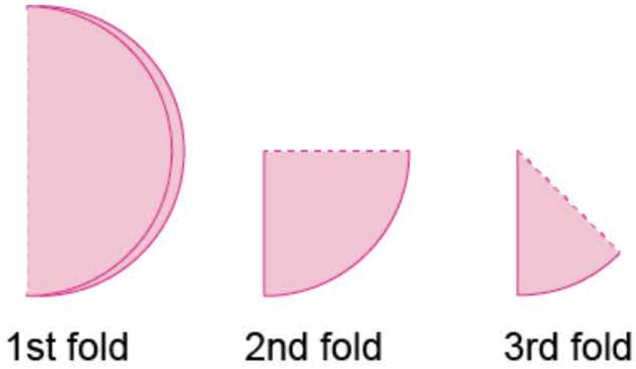


Bat
450 grams

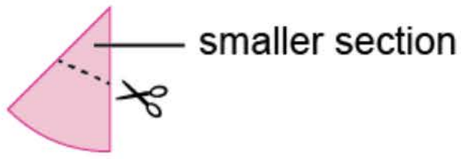
Which items can Pete post so that the total mass is as close as possible to 2000 grams?

- [ ] all 4 items
- [ ] the helmet and the bat
- [ ] the baseball, bat and glove
- [ ] the helmet, baseball and glove

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

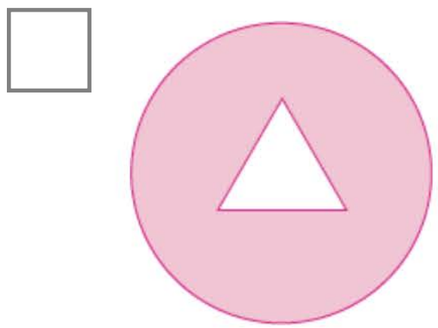


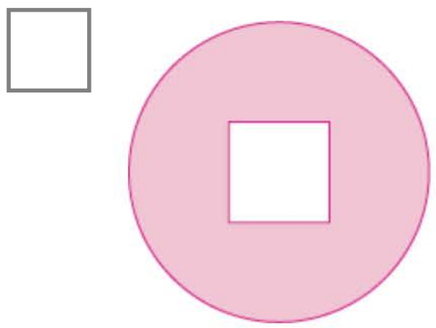

She then cut along this dotted line and threw away the smaller section.

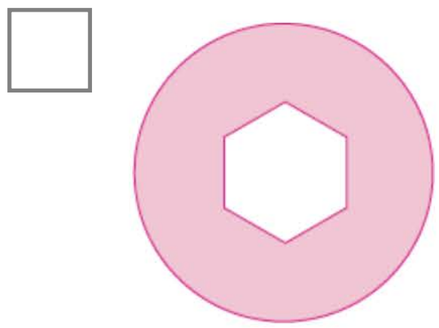


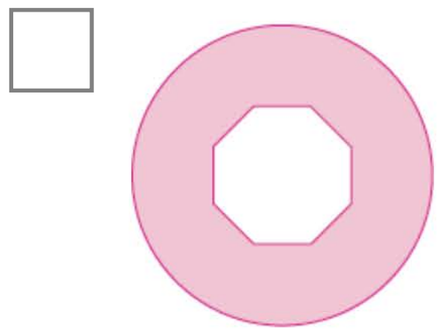

Sue unfolded the remaining piece.

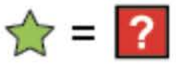
Which of these is the shape of the remaining piece?











- 5
- 6
- 7
- 8

The time in Redville is 2 hours ahead of the time in Bluehill.

The time in Bluehill is 3 hours behind the time in Greenbridge.

What is the time in Greenbridge if it is 6 pm in Redville?

- [ ] 11 pm
- [ ] 7 pm
- [ ] 5 pm
- [ ] 1 pm

Eve gave some of her marbles to three of her friends.

She gave 10% to Adrian, 25% to Barbara and 50% to Ken.

She kept 30 marbles for herself.

How many marbles did she start with?

- [ ] 100
- [ ] 120
- [ ] 170
- [ ] 200

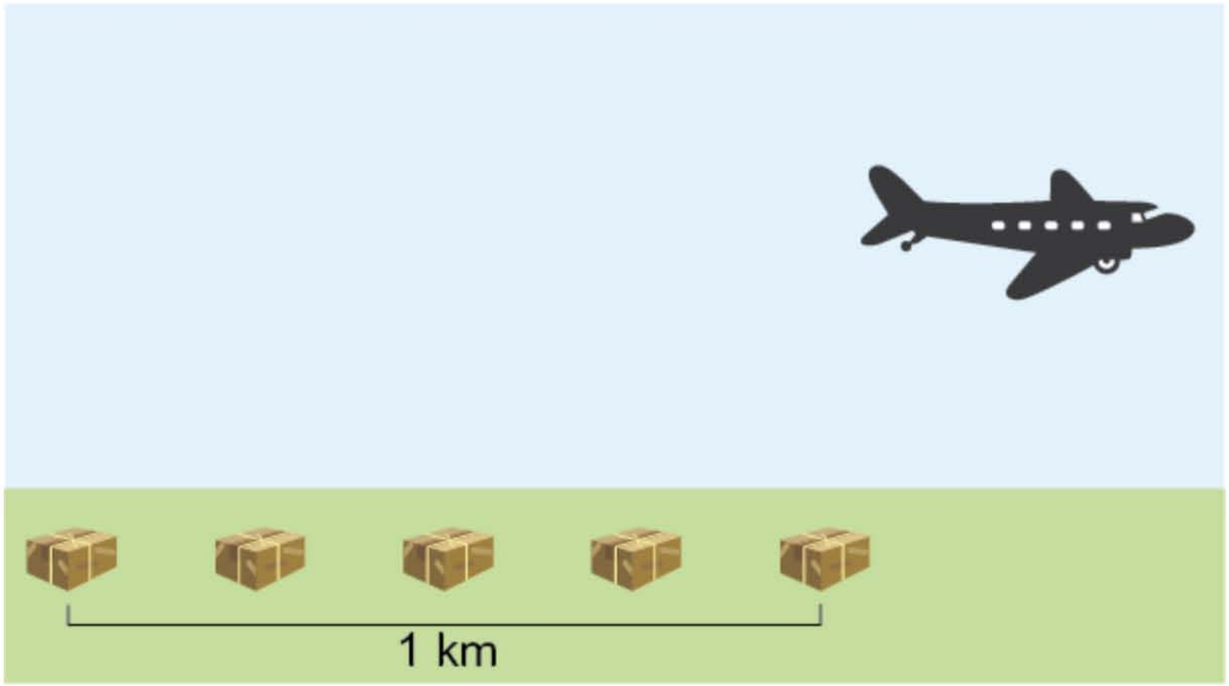
Each row in this table forms a number pattern.

| | | | | |
|---|---|---|---|---|
| 10 | 20 | 30 | 40 | ★ |
| 2 | 4 | 8 | 16 | ● |

What is ★ − ●?

- 50
- 32
- 26
- 18

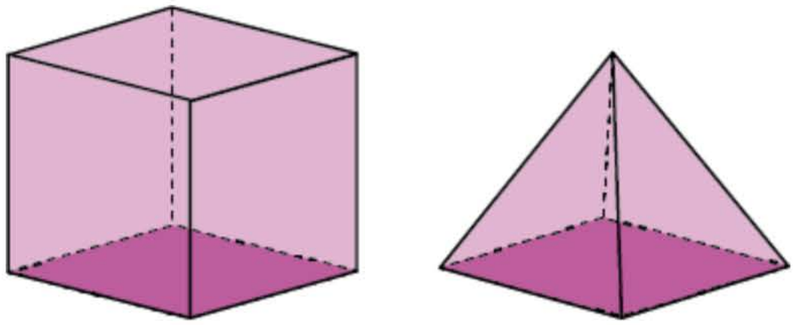
A plane drops 5 parcels of emergency supplies at equal intervals over a distance of 1 kilometre.




About how many metres is between each parcel?

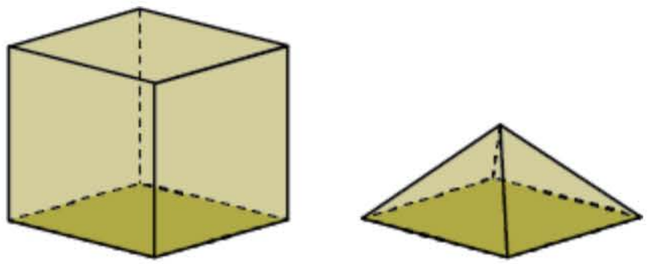
- [ ] 5
- [ ] 200
- [ ] 250
- [ ] 500

The cube and square pyramid below have the same height and base.



The volume of the cube is three times the volume of the pyramid.

Mia has a cube and a square pyramid.

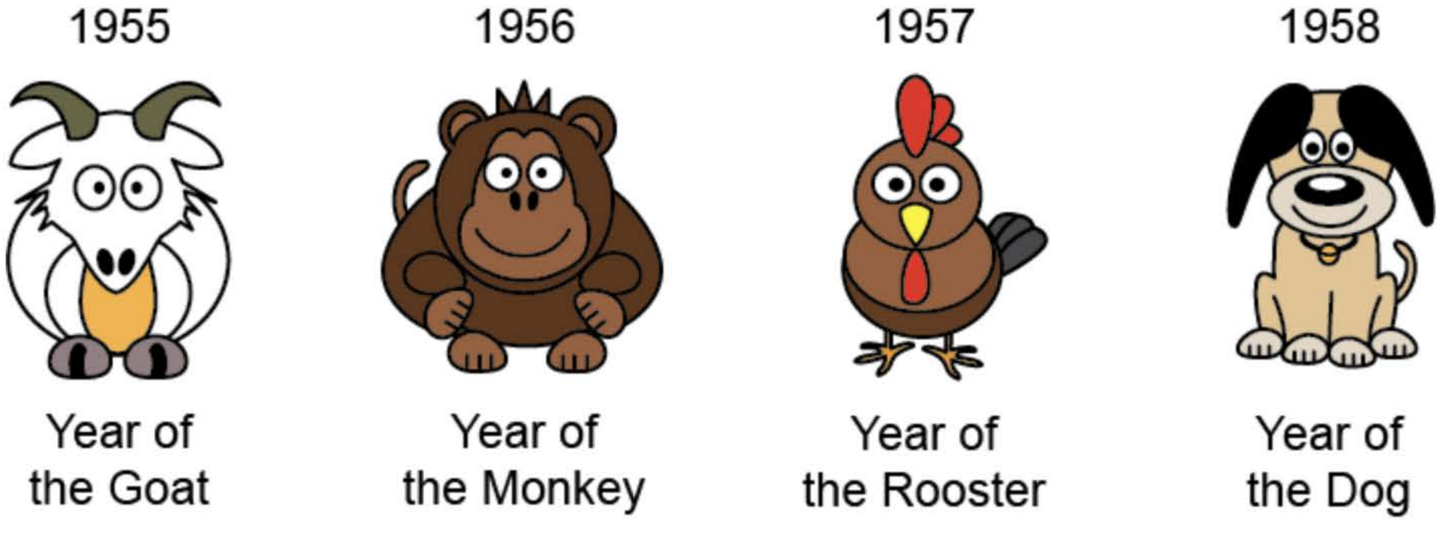


Mia's shapes have the same base, but the cube is twice as high as the pyramid.

How many times greater than the volume of Mia's pyramid is the volume of Mia's cube?

- ☐ 8
- ☐ 6
- ☐ 4
- ☐ 2

There are 12 animal signs in the Chinese calendar. They repeat every 12 years in the same order. For example, people born in 1955 or 1967 were born in the ‘Year of the Goat’.



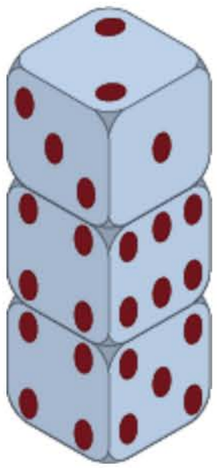

Cai turned 35 on 20 April 2017.

In which ‘Year’ was Cai born?

- [ ] Year of the Dog
- [ ] Year of the Goat
- [ ] Year of the Rooster
- [ ] Year of the Monkey

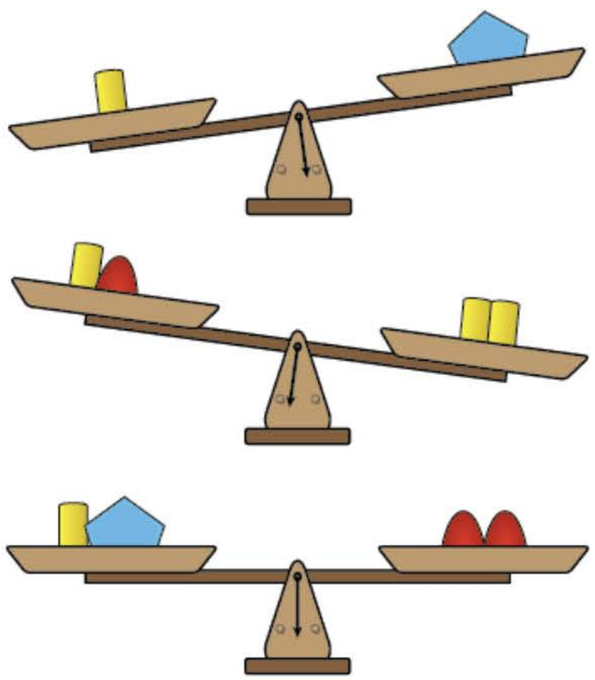
The picture shows a stack of three dice.

The number of dots on the opposite faces of a dice add up to 7.

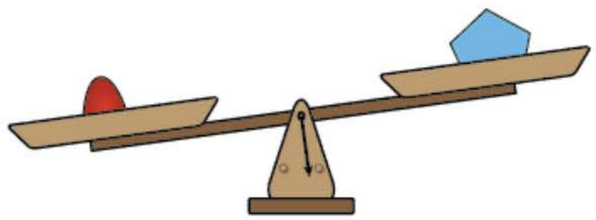


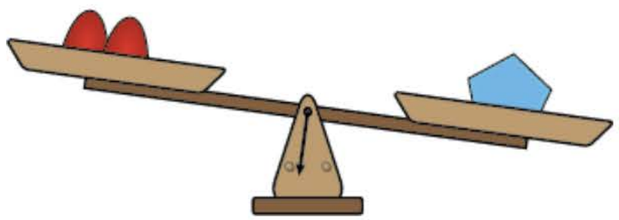
How many dots are **not** shown in the picture? Type your answer in the box.

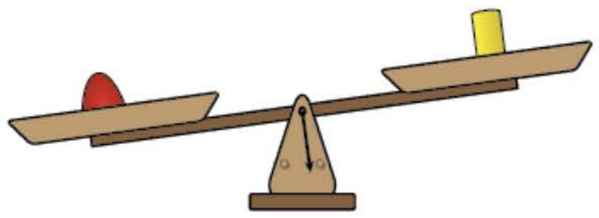
Ravi used a balance to compare the masses of some objects. His results are shown below.

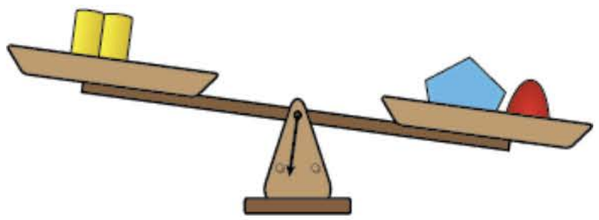


Which of the following must be true?

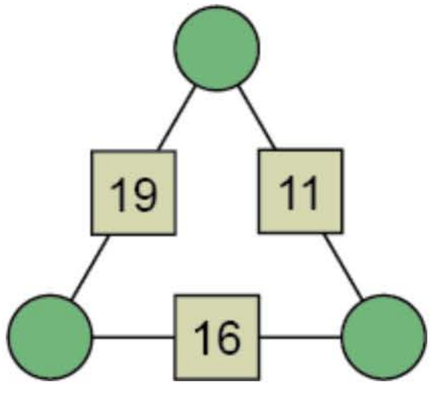








The number in each square is equal to the sum of the numbers in the circles joined to the square.




What is the sum of the numbers in the circles?

- [ ] 17
- [ ] 23
- [ ] 24
- [ ] 46

In Mathland, the money is called zees and zeds.

**1 zee = 111 zeds**

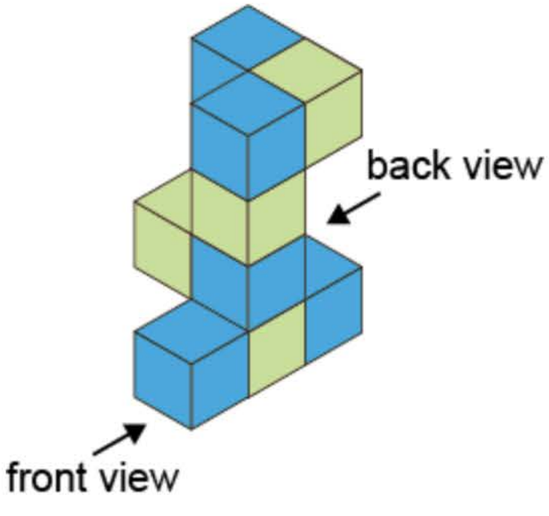
Each row of fruit costs 60 zeds:


Elvis buys one of each fruit.

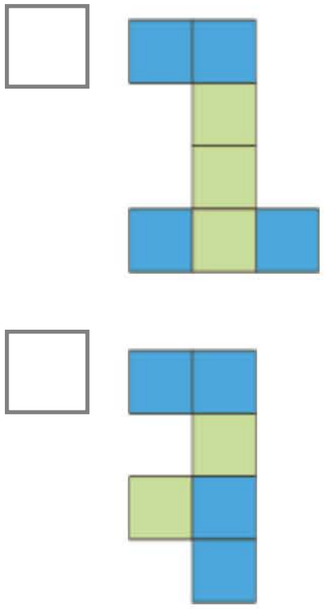
How many zeds does he get back if he pays 1 zee? Type your answer in the box.

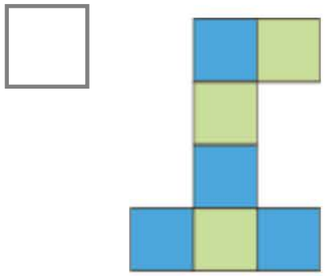
[ ] zeds

The object below is made with 5 blue cubes and 4 green cubes.

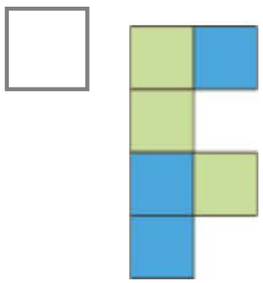



Which drawing shows the object as seen from the back?







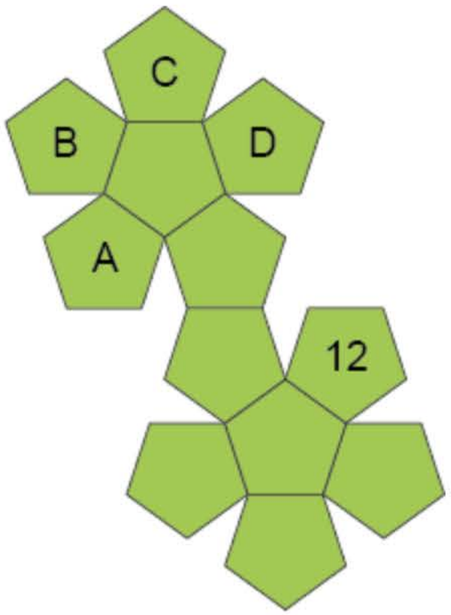


On a particular day, the number of hours left in the day is $\frac{3}{5}$ the number of hours that have already passed.

How many hours are left in that day?

- [ ] 6
- [ ] 9
- [ ] 15
- [ ] 18

Lien folded this net to make a 12-sided dice.




He placed it on the table so that 12 was showing on top.

Which face was on the bottom?

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

Paul had a square piece of paper.

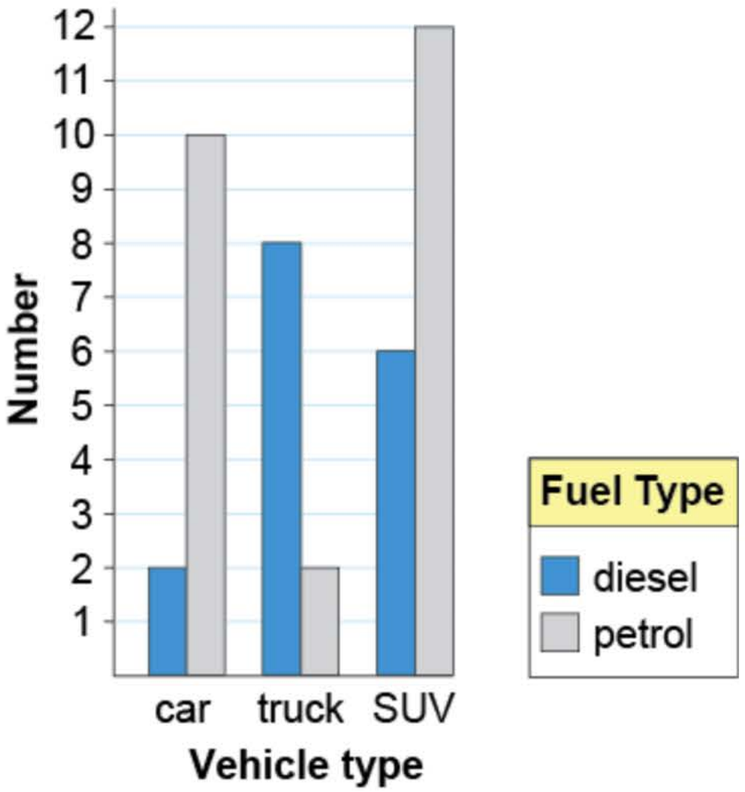
He cut out a rectangle from the paper that was 4 centimetres by 9 centimetres.

The area of the leftover paper was 108 square centimetres.

What was the length of the sides of Paul's original square?

- [ ] 9 centimetres
- [ ] 11 centimetres
- [ ] 12 centimetres
- [ ] 13 centimetres

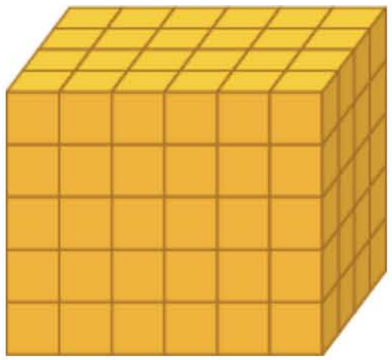
Ben collected data on the vehicles in a car park and graphed his results.




Which statement about the vehicles in the car park is **not** true?

- [ ] He collected data on 40 vehicles.
- [ ] One-fifth of the cars use diesel.
- [ ] One-third of the SUVs use diesel.
- [ ] Two-fifths of the vehicles use diesel.

This solid rectangular prism has been built using identical cubes.



Some of the cubes cannot be seen in this drawing.

How many cubes **cannot** be seen in this drawing?

- ☐ 46
- ☐ 60
- ☐ 74
- ☐ 80

Angela is making cheesecake using this recipe.

**Ingredients**

- $\frac{1}{4}$ cup butter
- $1\frac{1}{3}$ cups breadcrumbs
- $\frac{1}{4}$ cup honey
- 3 packets cream cheese
- 2 teaspoons vanilla

Angela only has a teaspoon, so she estimates these conversions:

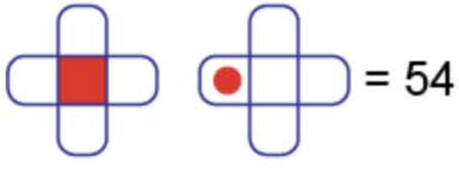
- 1 tablespoon = 4 teaspoons
- 1 cup = 16 tablespoons

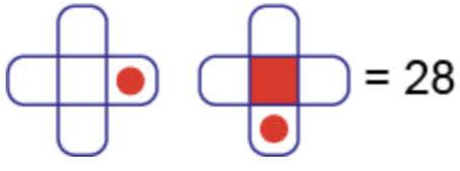
How many teaspoons of honey does Angela need for her recipe?

☐ 64 ☐ 16 ☐ 4 ☐ $\frac{1}{4}$

Lois is playing a code-breaker game on the computer. She is given three clues.

 = 1

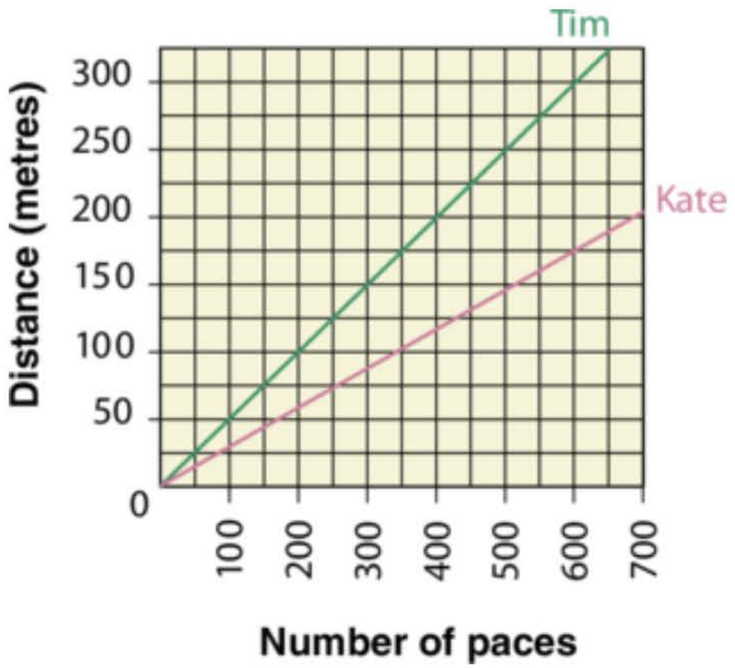
 = 54

 = 28

What is the number shown by this code?

- [ ] 639
- [ ] 729
- [ ] 826
- [ ] 936

This graph shows how many paces Kate and Tim take to walk certain distances.



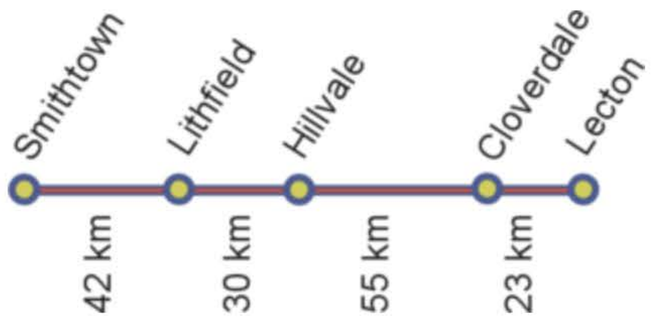

Kate takes 600 paces to walk from school to the local shops.

How many paces does Tim take to walk from school to the local shops?

Joe travelled from Smithtown to Lecton without stopping.

He left Smithtown at 9:00 am and arrived in Lecton at 11:15 am.

Joe passed through several towns on the way. The diagram shows the distances between them.



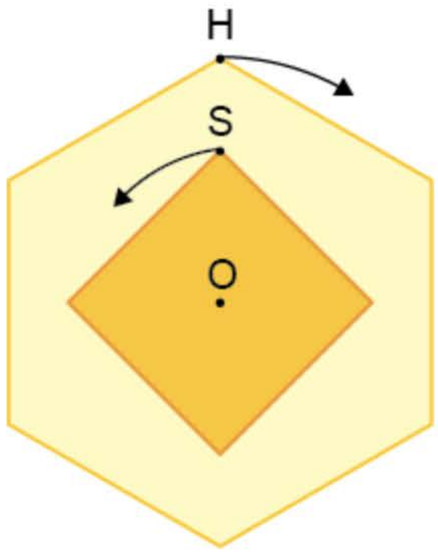

This table shows the time at which Joe passed through each town.

| Town passed | Time |
|---|---|
| Lithfield | 9:40 am |
| Hillvale | 10:05 am |
| Cloverdale | 10:55 am |

Between which two towns did Joe travel at the highest average speed?

- [ ] Smithtown and Lithfield
- [ ] Lithfield and Hillvale
- [ ] Hillvale and Cloverdale
- [ ] Cloverdale and Lecton

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.

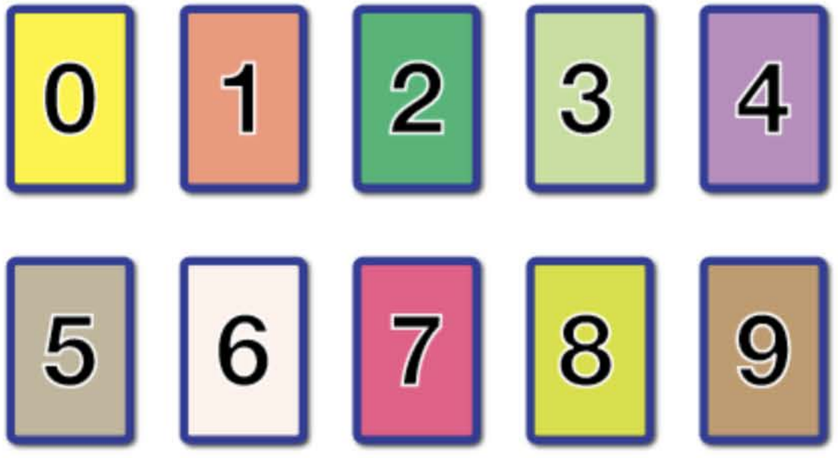
How many clicks does the hexagonal cog make before the vertices H and S first return together to their original position?

A cube has a volume of 1000 cubic centimetres.

What is the sum of the lengths of the edges of the cube, in centimetres?

- [ ] 30
- [ ] 60
- [ ] 80
- [ ] 120

Eight of the cards are used to form two 4-digit numbers.




What is the smallest possible difference between these two numbers?

# Results

| Question number | Correct answer | Mark | Category | Descriptor |
|---|---|---|---|---|
| 1 | A | | Space & Geometry | Identify the reflection in a line of symmetry |
| 2 | A | | Chance & Data | Estimate the likelihood of an event |
| 3 | D | | Number & Arithmetic | Solve a problem using subtraction and division |
| 4 | D | | Space & Geometry | Identify the missing picture in a pattern |
| 5 | A | | Number & Arithmetic | Solve a problem involving quarters |
| 6 | B | | Chance & Data | Determine the number of possible outcomes for a situation |
| 7 | A | | Number & Arithmetic | Solve a problem using addition, subtraction and multiplication |
| 8 | C | | Space & Geometry | Count the number of lines parallel to a specific line |
| 9 | B | | Algebra & Patterns | Solve a problem using division and multiplication |
| 10 | A | | Number & Arithmetic | Compare fractions, ratios and percentages to identify the correct statement |
| 11 | C | | Measures & Units | Measure the length of an object using a ruler marked in centimetres |
| 12 | A | | Space & Geometry | Recognise a congruent shape after a quarter turn |
| 13 | D | | Number & Arithmetic | Order numbers correct to the nearest hundredth |
| 14 | D | | Chance & Data | Calculate a missing number in a table |
| 15 | D | | Measures & Units | Determine the objects which have a total mass closest to a target mass |
| 16 | D | | Space & Geometry | Identify a 2D shape after folding and cutting |
| 17 | A | | Algebra & Patterns | Find the value of a symbol given two number sentences |
| 18 | B | | Measures & Units | Calculate the time difference between 2 cities given a 3rd city as point of reference |
| 19 | D | | Number & Arithmetic | Solve a problem involving percentages and the unitary method |
| 20 | D | | Algebra & Patterns | Recognise two number sequences and find the difference between the fifth terms |
| 21 | C | | Measures & Units | Divide a length into equal parts |
| 22 | B | | Space & Geometry | Find the relationship between the volume of two 3D shapes |
| 23 | A | | Measures & Units | Use information about the date and the Chinese calendar to solve a problem |
| 24 | 38 | | Number & Arithmetic | Solve an addition problem involving the numbers on a stack of dice |
| 25 | A | | Measures & Units | Apply logic to solve a balance problem |
| 26 | B | | Number & Arithmetic | Use logic and number facts to solve a problem |
| 27 | 18 | | Algebra & Patterns | Interpret the value of symbols and solve a problem using division, addition and subtraction |
| 28 | D | | Space & Geometry | Identify the back view of a 3D shape |
| 29 | B | | Number & Arithmetic | Evaluate the hours left in a day as a fraction of the hours that have elapsed |
| 30 | B | | Space & Geometry | Determine the letter on the bottom of a dodecahedron with the face label of 12 on top |

# Results

| Question number | Correct answer | Mark | Category | Descriptor |
|---|---|---|---|---|
| 31 | C | ☐ ☐ | Measures & Units | Solve a problem involving the area and length of rectangles |
| 32 | B | ☐ ☐ | Chance & Data | Interpret a column graph to identify an untrue statement |
| 33 | B | ☐ ☐ | Space & Geometry | Calculate the number of hidden cubes in a rectangular prism |
| 34 | B | ☐ ☐ | Measures & Units | Solve a measurement problem given a conversion table |
| 35 | D | ☐ ☐ | Algebra & Patterns | Model numbers up to 999 using a code |
| 36 | 350 | ☐ ☐ | Chance & Data | Solve a problem using a double line graph |
| 37 | B | ☐ ☐ | Measures & Units | Solve a word problem involving average speed |
| 38 | 12 | ☐ ☐ | Space & Geometry | Rotate two regular shapes and compare their positions |
| 39 | D | ☐ ☐ | Measures & Units | Calculate the sum of the length of the edges of a cube given its volume |
| 40 | 25 | ☐ ☐ | Number & Arithmetic | Evaluate the difference between two 4-digit numbers |

You have completed this practice test.

Your mark is 0 / 40 0%

Click here to reset the test and try again.

ICAS.