Student application number	C	2	2	0				

First name(s) _____

Family name _____

3280737078

Opportunity Class Placement Test

Mathematical Reasoning Question Paper

2022 **40 minutes**

INSTRUCTIONS FOR CANDIDATES

Please read this page carefully.

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

A separate answer sheet is provided for this test. Please fill in the following information on your answer sheet and on this question paper:

- Student application number
- First name(s)
- Family name

There are **35** questions in this paper. For each question there are five possible answers, **A**, **B**, **C**, **D** and **E**. Choose the **one** correct answer and record your choice on the separate answer sheet. If you make a mistake, erase thoroughly and try again.

You will **not** lose marks for incorrect answers, so you should attempt **all 35** questions.

You **must** complete the answer sheet within the time limit. There will **not** be any extra time at the end of the exam to record your answers on the answer sheet.

You can use the question paper for working out, but no extra paper is allowed.

Calculators and dictionaries are **NOT** allowed.

Cambridge Assessment Admissions Testing

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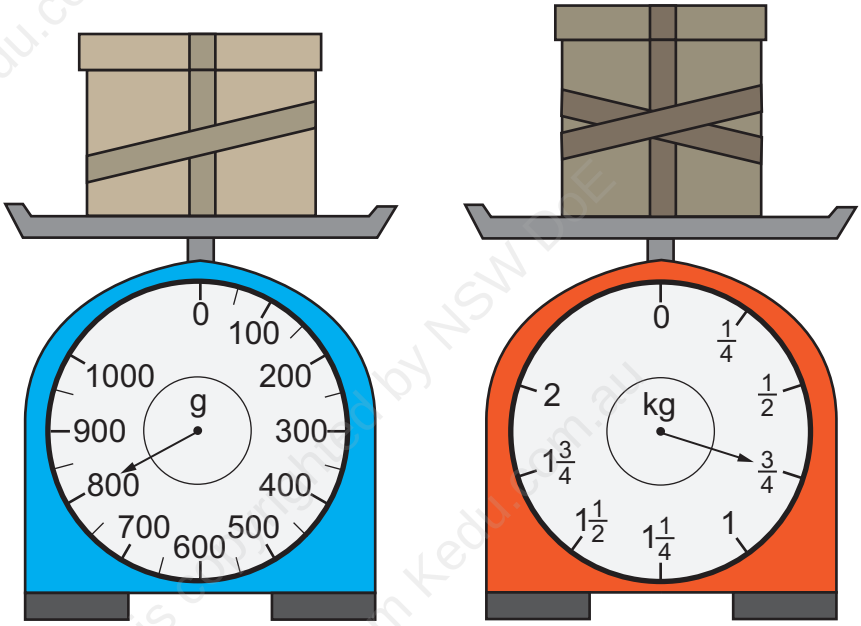
1 Two parcels are each weighed on different scales.

One scale is labelled in grams and the other in kilograms.



What is the difference between the masses of the two parcels in the diagram?

A 50 g

B 60 g

C 150 g

D 460 g

E 725 g

2 A factory makes 3 cars every 8 hours.

If the factory runs all day and all night, Monday to Sunday, how many cars does it make in a whole week?

A 24

B 56

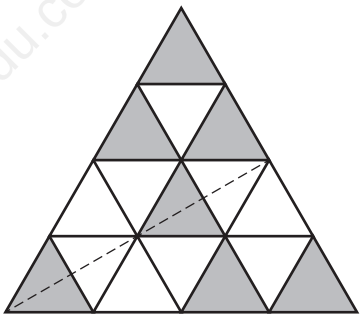
C 63

D 168

E 504

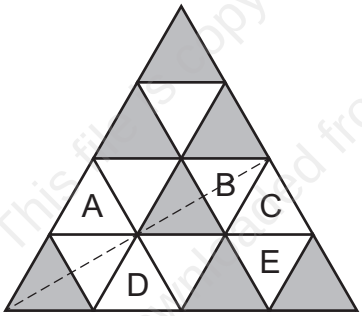
3 Here is a large triangle with equal sides. It is made of 16 identical smaller triangles.

Some of the smaller triangles are shaded.



Miriam wants to shade only one more small triangle, so that the dotted line is a line of symmetry.

Which triangle should she shade?



A A

B B

C C

D D

E E

4 Three years ago, the total of Sunil's and Helen's ages was 27.

In five years from now, what will be the total of their ages?

A 31

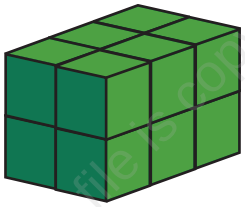
B 35

C 38

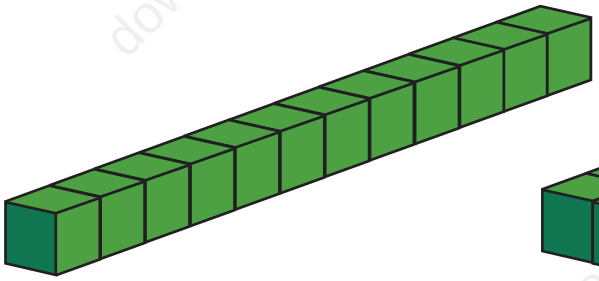
D 40

E 43

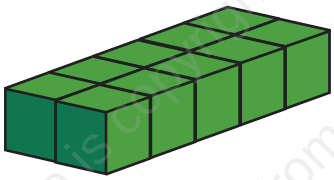
5 Miro makes a rectangular prism using cubes.



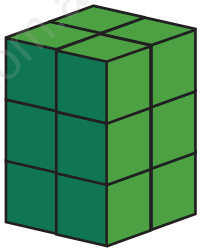
Here are three more rectangular prisms. The cubes in these prisms are the same size as the cubes in Miro's prism.



prism 1



prism 2



prism 3

Which of these prisms has/have the same volume as Miro's prism?

A prism 1 only

B prism 3 only

C prisms 1 and 2 only

D prisms 1 and 3 only

E prisms 2 and 3 only

6 A birthday party lasted 4 hours 25 minutes.

It finished at quarter to three.

When did the party start?

A twenty past ten

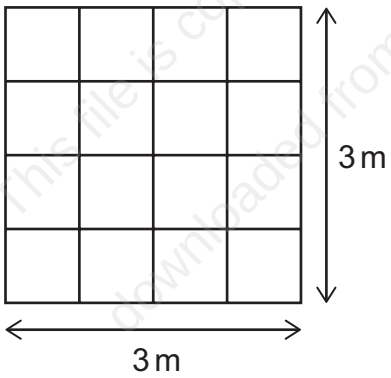
B half past ten

C ten to eleven

D ten past eleven

E ten past one

7 What is the total length of all of the lines in this grid?



A 9 m

B 12 m

C 15 m

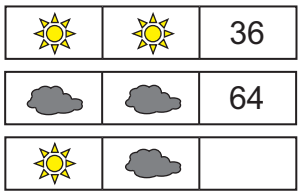
D 24 m

E 30 m

8 In the diagram below, each ★ is equal to 3.

The values of the stars are multiplied: $3 \times 3 = 9$

The diagrams below work in the same way.



What number belongs in the empty box?

A 24

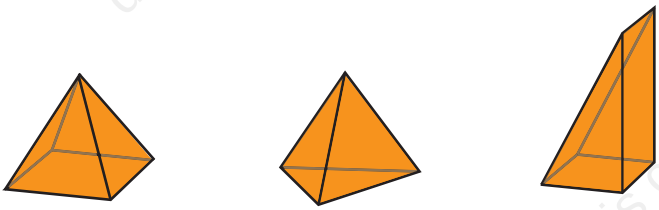
B 42

C 48

D 50

E 100

9



object 1 object 2 object 3

Which of these three-dimensional objects has/have exactly 5 faces, 8 edges and 5 vertices?

A object 1 only

B object 3 only

C objects 1 and 2 only

D objects 1 and 3 only

E objects 1, 2 and 3

10 Lucy has three counters.

Each counter has a different number on it, as shown.

She uses all the counters to make different 3-digit numbers.

What is the difference between the smallest **odd** 3-digit number she can make and the smallest **even** 3-digit number she can make?

A 63

B 77

C 99

D 153

E 167

11 My pet lizard is 23 centimetres long.

My pet cat is twice as long as my lizard.

My pet dog is 35 centimetres longer than my cat.

My pet stick insect is 60 millimetres long.

How much longer is my dog than my stick insect?

A 21 cm

B 40 cm

C 52 cm

D 65 cm

E 75 cm

12 A hardware store sells the following items:

- nails for 20c
- bolts for 15c
- screws for 10c

Jimmy buys one item and pays with one dollar.

He receives change made up of three coins, all of different values.

Which of the items could he have bought?

A nail only

B screw only

C nail or screw only

D screw or bolt only

E nail or screw or bolt

13 Sam is looking at a map. He sees that a path runs from his house to a mountain.

Sam thinks the path goes north (N), then north-east (NE), then west (W).

Sam then realises he has the map upside-down.

In which directions does the path actually go, from Sam's house to the mountain?

A E, then SW, then S

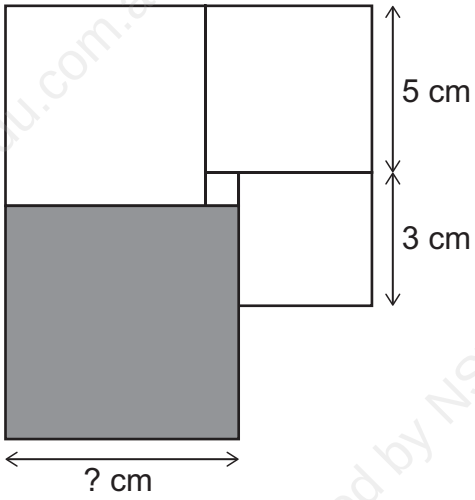
B S, then SE, then E

C S, then SE, then W

D S, then SW, then E

E W, then NE, then N

14 This diagram is made up of five squares:



[diagram not to scale]

What is the side length of the shaded square?

A 8 cm

B 9 cm

C 10 cm

D 11 cm

E 12 cm

15 In a shop selling kitchen items, the cost of 10 plates is the same as the cost of 4 plates and 4 bowls.

How many bowls would cost the same as 9 plates?

A 6

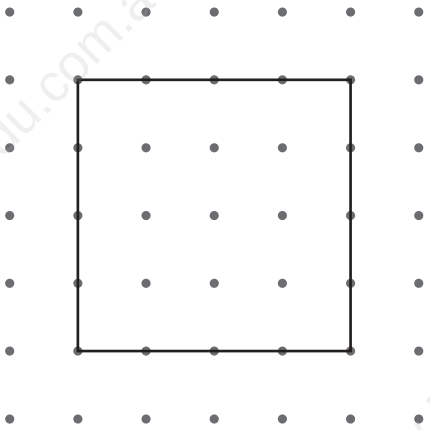
B 7

C 8

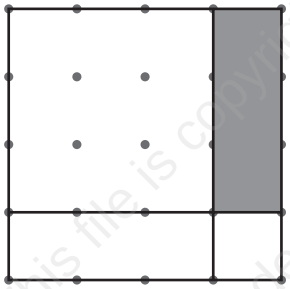
D 9

E 10

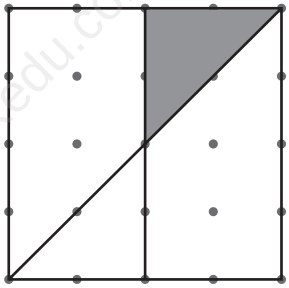
16 Karl draws 5 squares on dotted paper. Each square looks like this:



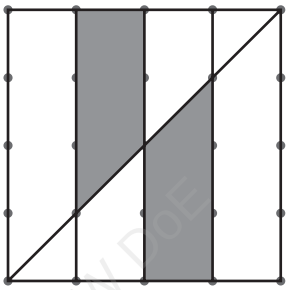
He connects the dots to make shapes inside the squares:



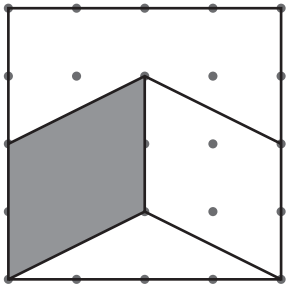
drawing A



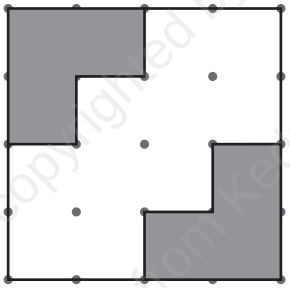
drawing B



drawing C



drawing D



drawing E

Which of the drawings has exactly $\frac{1}{4}$ shaded?

A drawing A

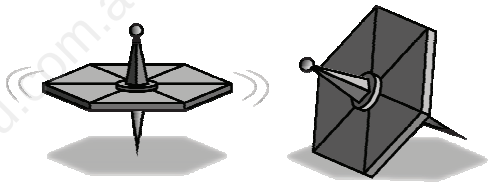
B drawing B

C drawing C

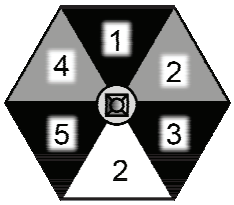
D drawing D

E drawing E

17 Jannali spins a spinner like this.



The spinner has different colours and numbers on each face. Each of the six sections has an equal chance of being landed on.



Which of these statements are correct whenever Jannali spins the spinner?

1 The spinner is equally likely to land on an odd or an even number.

2 If the spinner lands on black, then the number is odd.

3 If the spinner lands on an even number, then the colour is grey.

4 If the spinner lands on white, then it is impossible for the number to be odd.

A statements 1, 2 and 3 only

B statements 1, 2 and 4 only

C statements 1, 3 and 4 only

D statements 2, 3 and 4 only

E statements 1, 2, 3 and 4

18 There are four cardboard boxes: P, Q, R and S.

Box P is 3 kg heavier than box Q.

Box Q is 5 kg lighter than box R.

Box S is 4 kg lighter than box R.

What is the difference in weight between the heaviest box and the lightest box?

A 5 kg

B 7 kg

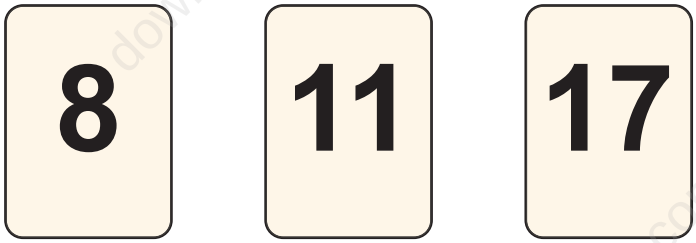
C 8 kg

D 9 kg

E 12 kg

19 Jake decides to call a number 'thriving' if it has the same remainder when it is divided by 3 as when it is divided by 5.

Which of these numbers would Jake call 'thriving'?



A none of them

B 8 only

C 11 only

D 17 only

E 8, 11 and 17

20 Lakshmi has twenty-nine 5 cent coins.

She wants to exchange as many of her 5 cent coins as she can, so that she has the same amount of money but **as few coins as possible**.

She can only exchange them for 10 cent, 20 cent or 50 cent coins, or a mixture of these.

After she has made the exchange, how many coins will she have in total?

A 4

B 5

C 6

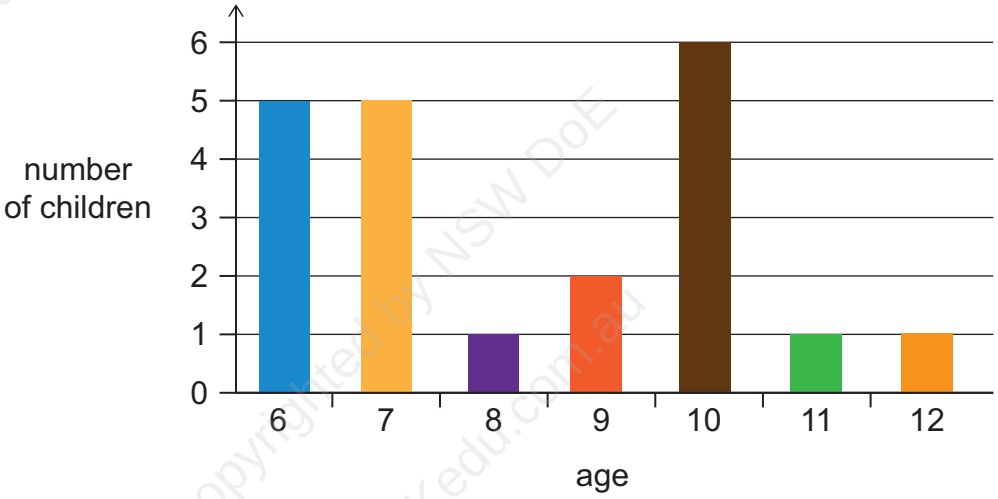
D 7

E 8

21 The Williams family invite their neighbours to a barbecue.

There are 21 children at the barbecue.

The column graph shows their ages.



All of the children line up in order of their ages.

What is the age of the child standing in the middle of the line?

A 7

B 8

C 9

D 10

E 11

22 Six different numbers are written in order, from smallest to largest.

Some of the digits have been covered by cards:

Each  is covering the same digit.

Each  is covering the same digit.

Find the total of the digit under  and the digit under  .

A 2

B 3

C 4

D 5

E 6

23 Sylvie separated a box of cherries into 3 piles.

For every 2 cherries she put in the first pile, she put 5 cherries in the second pile and 3 cherries in the third pile, until there were no cherries left over.

When Sylvie had finished, there were 24 cherries in the third pile.

How many cherries were in the box altogether?

A 40

B 72

C 80

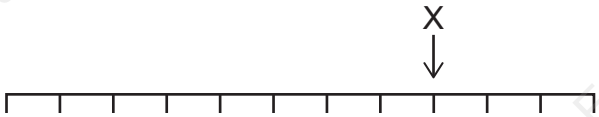
D 120

E 240

24 The numbers

0.2, 0.12, 0.09, 0.1, 0.17

can each be placed under a mark on this number line:



Which number must be at X?

A 0.2

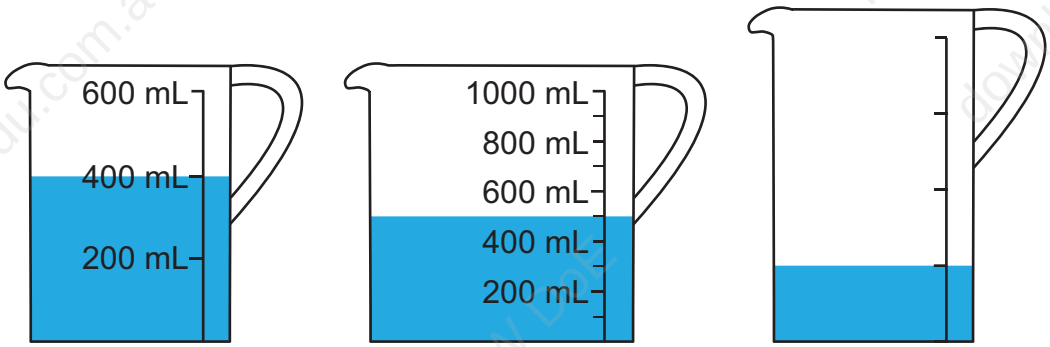
B 0.12

C 0.09

D 0.1

E 0.17

25 Three jugs, X, Y and Z, contain some liquid.



jug X jug Y jug Z

Jug Z has a total capacity of 1 litre.

Kim pours liquid from jugs X and Y into jug Z, until jug Z is full.

Afterwards, how much liquid is left in jugs X and Y altogether?

A 100 mL

B 150 mL

C 200 mL

D 300 mL

E 650 mL

26 Julian has square tiles that each have sides of length 50 cm.

His tiles cover a total area of $2\frac{1}{2}$ square metres.

How many tiles does Julian have?

A $2\frac{1}{2}$

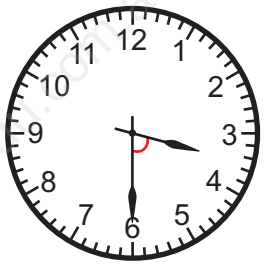
B 5

C 9

D 10

E 25

27 The time now is 3:30.



The angle from the hour hand to the minute hand, measured clockwise, is shown in red.

5 minutes later, the angle will be larger.

What type of angle will it be?

A acute angle

B obtuse angle

C reflex angle

D right angle

E straight angle

28 A newspaper is made from a pile of 8 large sheets.

The whole pile is folded in half.

The pages are numbered 1 to 32.

Which other pages are on the same large sheet as page 6?

A 5, 25, 26

B 5, 27, 28

C 7, 25, 26

D 7, 27, 28

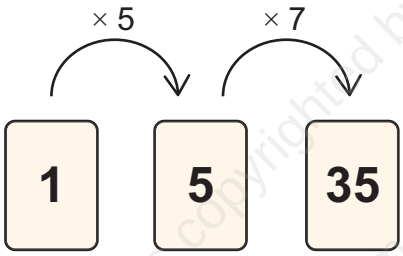
E 8, 23, 24

29 Leo has 100 cards numbered from 1 to 100.

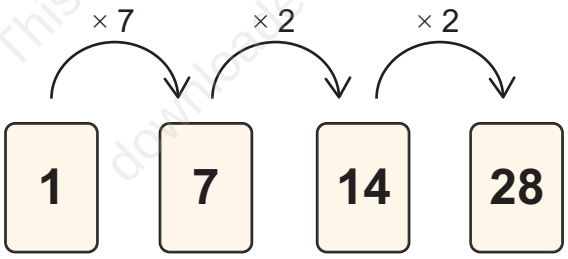
He can use the cards to make chains of numbers.

To make a chain, Leo chooses a first number. Each number after that is made by multiplying the previous number by a **single-digit** number greater than 1.

Here is a chain that starts with 1 and ends with 35.



Here is a chain that starts with 1 and ends with 28.



How many possible chains, of any length, start with 1 and end with 12?

A 4

B 5

C 6

D 7

E 8

30 How many of the numbers from 1 to 99 have exactly one digit that is a 1?

A 9

B 10

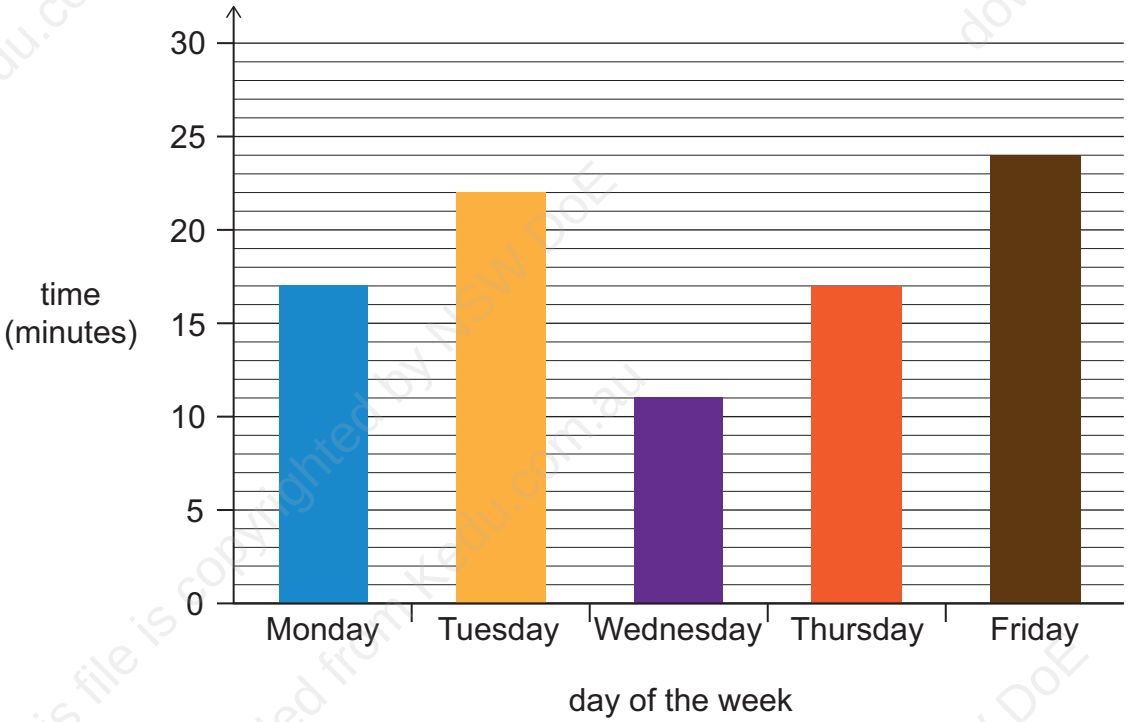
C 18

D 19

E 20

31 Marlene was preparing for a race. She ran the same distance every day for five days.

The graph shows the time taken, in minutes, to complete her run each day.



Which of these statements is/are correct?

1 Marlene ran fastest on Friday.

2 Marlene's time on Tuesday was exactly half of her time on Wednesday.

3 Marlene's total time running on Tuesday and Wednesday was the same as her total time running on Monday and Thursday.

A none of them

B statement 1 only

C statement 2 only

D statement 3 only

E statements 1, 2 and 3

32 Laura has 3 identical pairs of pink gloves and 2 identical pairs of yellow gloves mixed together in a drawer.

Left-hand gloves are different from right-hand gloves.

She takes gloves out of the drawer one at a time, without looking, and puts them on a shelf.

What is the smallest number of gloves she must take out to be certain they include a left-hand glove and a right-hand glove of the same colour?

A 2

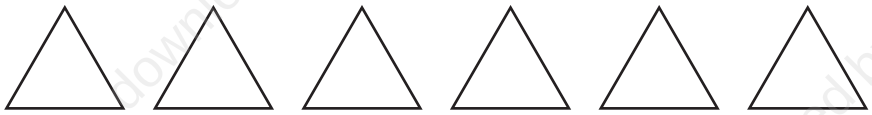
B 3

C 4

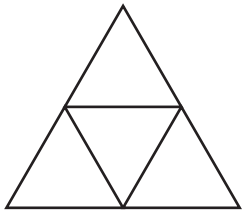
D 5

E 6

33 Peter has six identical paper triangles, shown here. All the sides of every triangle are the same length.



He can put some of these together to make different shapes (turning them if needed). For example, he can put four triangles together like this to make a larger triangle:



Which of the following shapes can Peter make by combining two or more of his triangles (with no gaps between triangles, and no overlapping triangles)?

A hexagon only

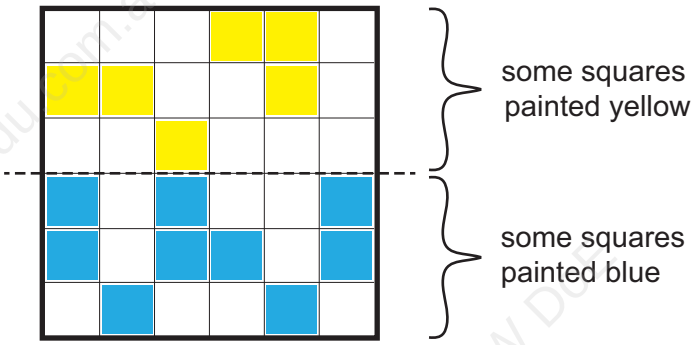
B parallelogram only

C hexagon and parallelogram only

D parallelogram and square only

E hexagon, parallelogram and square

34 A white piece of paper has a grid and some wet paint on it as shown:



The paper is folded along the dotted line and pressed together. If a blue square and a yellow square are pressed together, both squares will be green when the paper is unfolded.

After the paper is unfolded, how many green squares will there be?

A 1

B 2

C 3

D 4

E 6

35 Here is a number sequence:

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

The first number in the sequence is 2. After that, add $\frac{1}{3}$ every time to get the next number.

What is the 34^{th} number in the sequence?

A 11

B $11\frac{1}{3}$

C 12

D 13

E $13\frac{1}{3}$

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