Cambridge Assessment International Education

Cambridge Lower Secondary Sample Test

For use with curriculum published in September 2020

Mathematics Paper 2

Stage 8

1 hour

Name .....

Additional materials: Calculator
Geometrical instruments
Tracing paper (optional)

INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

1 A café has three different colours of plates in the ratio

grey : white : black = 3 : 8 : 5

The café has 304 plates altogether.

Work out how many **grey** plates the café has.

..... [2]

2 Find the number of kilometres approximately equivalent to 30 miles.

..... km [1]

3 **(a)** The password for a laptop is one of the five shown.

245tcb3 541tcb2 315tcc1 924tcc5 815tce2

Angelique says the probability the password contains the letter b is $\frac{1}{5}$

Tick (✓) to show if Angelique is correct or **not** correct.

correct ☐ **not** correct ☐

Explain your answer.

.....

..... [1]

(b) The code for Angelique's phone is four **different** digits from 1 to 9
The **first** digit is 6 and the other three digits are even.

Write a list of all the possible four-digit codes for Angelique's phone.

.....

..... [2]

4 Hassan buys an apartment for \$78 000
After one year the value **decreases** by 5%.

Work out the new value of Hassan's apartment.

\$ ..... [2]

5 Rearrange $p = \frac{m}{3}$ to make m the subject.

$m =$ ..... [1]

6 Draw a ring around **all** the fractions that are equivalent to recurring decimals.

$\frac{1}{3}$ $\frac{1}{5}$ $\frac{1}{7}$ $\frac{1}{8}$

[1]

7 x is a whole number.

$x \geq 0.5$

Write down the **smallest** possible value of x.

$x =$ ..... [1]

8 **(a)** The nth term of a sequence is $15 - \frac{n}{2}$

Work out the 8th term of the sequence.

..... [1]

(b) The first five terms of a different sequence are

1, 6, 11, 16, 21, …

Work out the nth term of this sequence.

..... [2]

9 Here are some words describing parts of the expression $3x + 5$

coefficient constant variable term

Use each word once to complete the statements.

x is a ..... 5 is a .....

3 is the ..... of x $3x$ is a .....

[1]

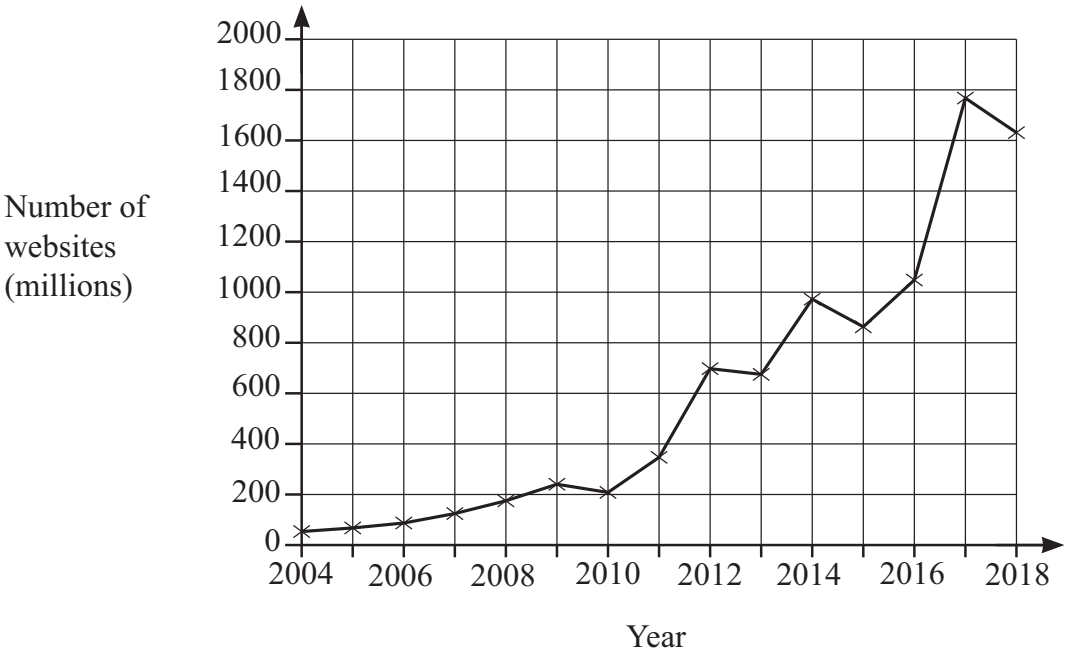
10 Safia is investigating how the number of websites in the world has changed over time.

(a) In the year 1999 there were 3 177 453 websites.

Write this number of websites correct to 2 significant figures.

..... [1]

(b) The graph shows the number of websites between the years 2004 and 2018



(i) Write down the **first** year that the number of websites reached over 200 million.

..... [1]

(ii) Write down the two consecutive years with the biggest increase in the number of websites.

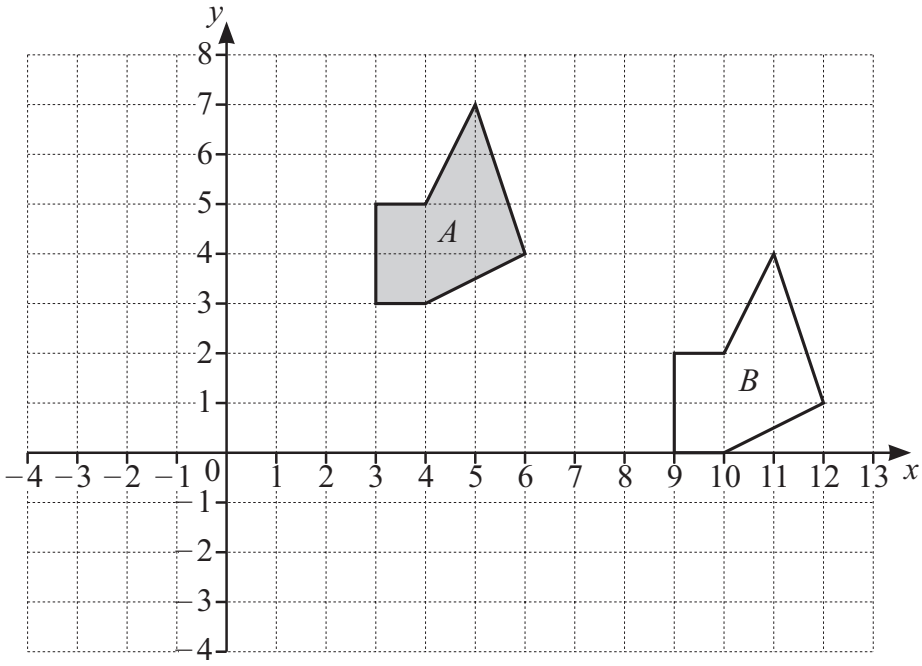
..... and ..... [1]

(c) In 1991 there was 1 website.
In 1992 there were 10 websites.

Work out the percentage change in the number of websites from 1991 to 1992

.....% [1]

11 **(a)** The diagram shows two shapes, A and B, drawn on a grid.



(i) Reflect shape A in the line $y = 2$

[2]

(ii) Write down the vector that translates shape A onto shape B.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$

[1]

(b) On a different grid shape C is translated to shape D by vector $\begin{pmatrix} -11 \\ -14 \end{pmatrix}$

Write down the vector that translates shape D onto shape C.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$

[1]

12 Expand and simplify.

$5x + 3x(4 - 2x)$

..... [2]

13 **(a)** Lily draws the graph of $y = 2x$

Write down the coordinates of two points that will be on this line.

(..... , ...) and (..... , ...) [1]

(b) Lily then draws the line $y = x + 2$

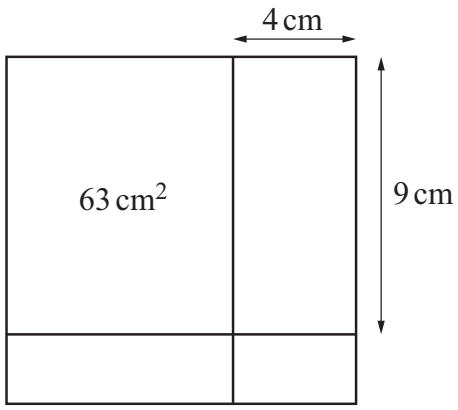
Write these coordinates in the correct place in the table.
One has been done for you.

(1, 3) (0, –2) (–3, –1) (0, 0) (0, 3) (–2, 0)

	On the line $y = x + 2$	**Not** on the line $y = x + 2$
Above the x-axis	(1, 3)	
Below the x-axis		
On the x-axis		

[2]

14 **(a)** The diagram shows a square.
The square is cut into four rectangles by two straight lines.
The area of the largest rectangle is 63 cm^2.

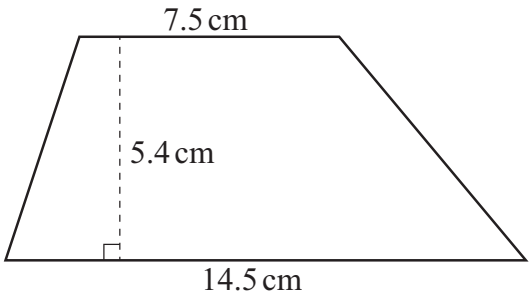


NOT TO SCALE

Work out the area of the smallest rectangle.

..... cm^2 [2]

(b) The diagram shows a trapezium.



NOT TO SCALE

Calculate the area of the trapezium.

..... cm^2 [2]

15 A 3D shape has 12 vertices and 30 edges.

Work out the number of faces on this shape.

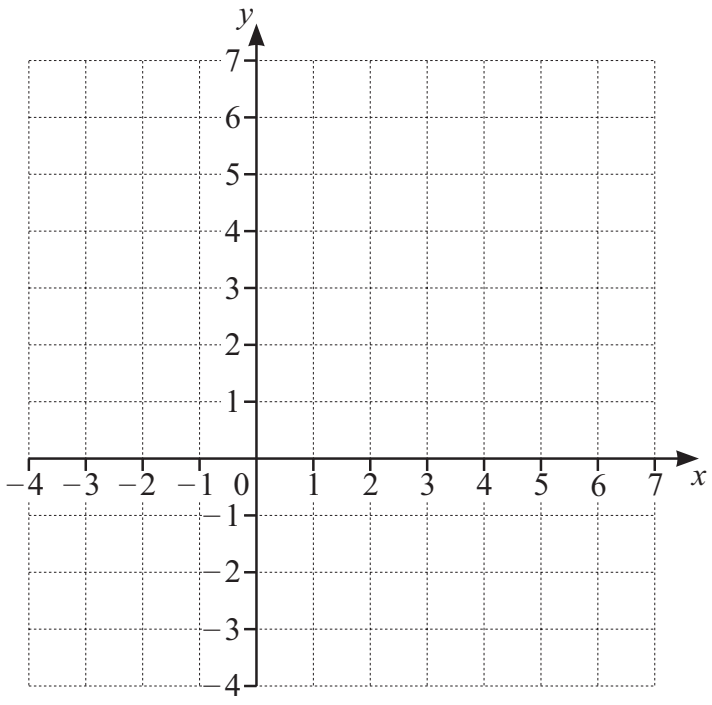
..... [1]

16 **(a)** Complete the table of values for $y = 2x - 1$

x	–1		3
y		–1	

[2]

(b) On the grid, draw the graph of $y = 2x - 1$



[2]

17 The wheel of a bicycle has a radius of 33 cm.
The bicycle travels 400 m.

Work out the number of times the wheel turns to cover this distance.
Give your answer correct to the nearest whole number.

..... [3]

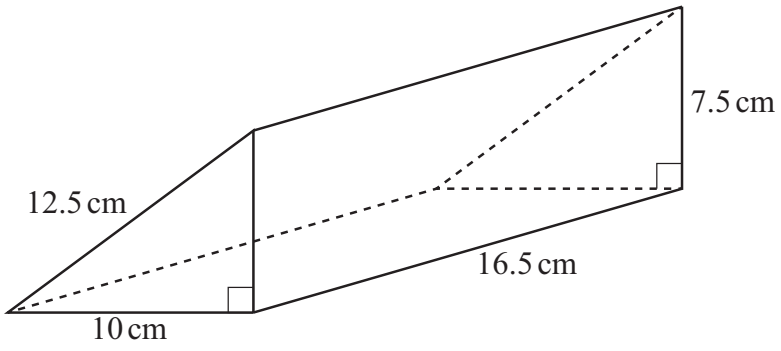
18 Rajiv does an experiment with four 6-sided dice, A, B, C and D.
He rolls each dice a total of 60 times and records the number of times he rolls the number 6

Dice	A	B	C	D
Number of times 6 is rolled	12	11	17	9

Write down the letter of the dice that is most likely **not** to be fair.

..... [1]

19 The diagram shows a solid triangular prism made of metal.



NOT TO SCALE

The cross-section is a right-angled triangle.
The prism is melted and made into cubes of side length 2.4 cm.

Find the total number of whole cubes that can be made.

..... [4]

20 **(a)** A quadrilateral contains at least one right angle and exactly two equal angles.
One of the angles in the quadrilateral is 70°.

Complete these sentences.

One set of possible angles in the quadrilateral is

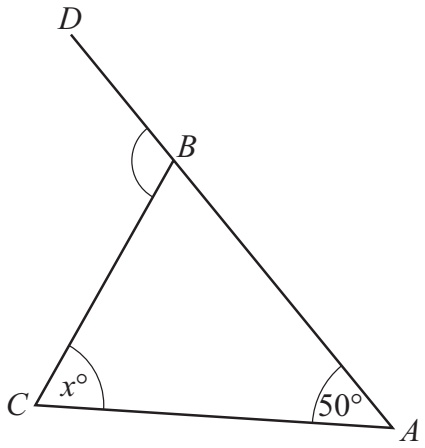
70° , ... ° , ... ° and ..... °

A **different** set of possible angles in the quadrilateral is

70° , ... ° , ... ° and ..... °

[2]

(b) The diagram shows a triangle *ABC*.
ABD is a straight line.

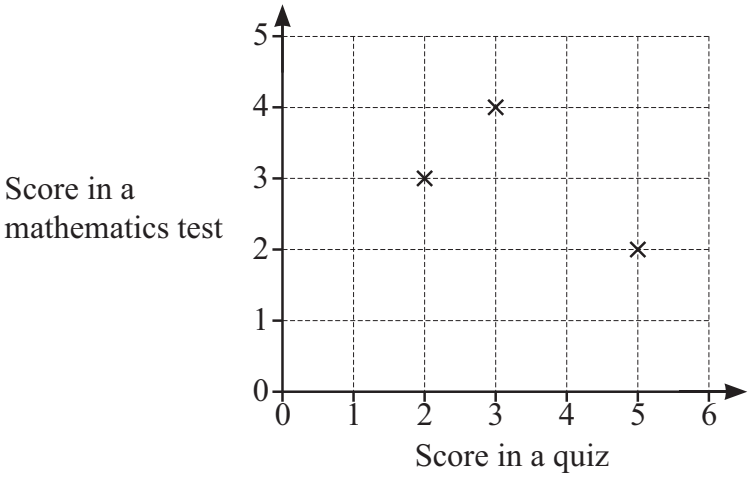


NOT TO SCALE

Write down an expression, in terms of x, for the angle *CBD*.

..... ° [1]

21 Mike is investigating to see if there is a relationship between the score in a quiz and the score in a mathematics test for people in his class.
He collects data from 3 people out of his class of 30
He then draws this scatter graph.



(a) Mike says, 'A higher score in the quiz means a higher score in the mathematics test.'

Explain how Mike can improve his investigation to see if this is true.

.....

..... [1]

(b) Tick (✓) to show if each statement about lines of best fit in a scatter graph are true or false.

Lines of best fit must **always**

	True	**False**
go through the origin	☐	☐
have a positive gradient	☐	☐
pass as close as possible to the points	☐	☐

[1]