



# Cambridge Lower Secondary Sample Test

## For use with curriculum published in September 2020

### Mathematics Paper 2

#### Stage 9

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 Simplify.

$$x^4 \times x^5$$

..... [1]

2 Here is an expression  $\frac{3(x-2)^2}{5}$

A value of  $x$  is substituted into the expression.

Tick (✓) the operation that is performed **first** when the value of this expression is calculated.

× 3	
− 2	
Square	
÷ 5	

[1]

3 The length of a book is 25 cm to the nearest centimetre.

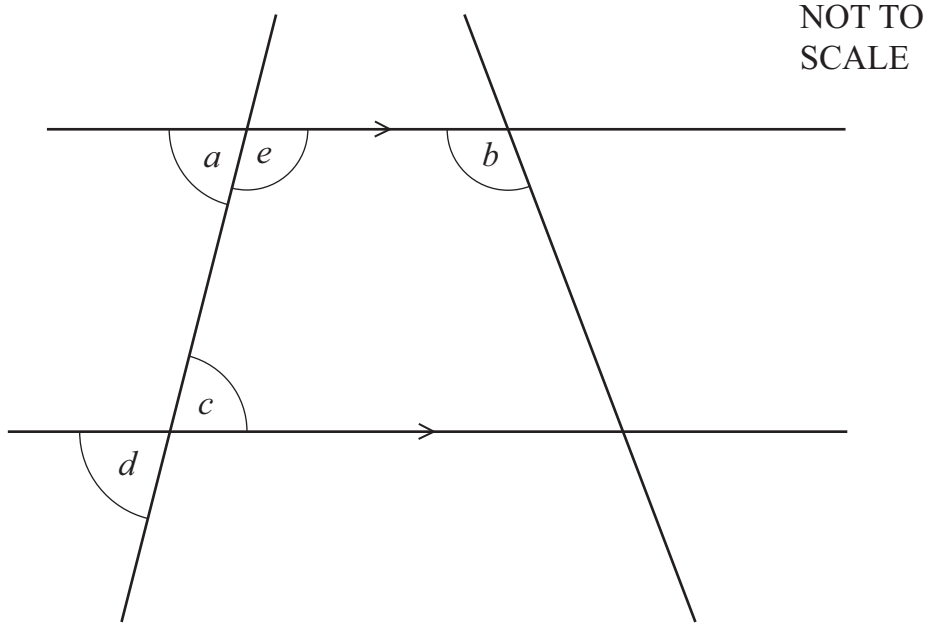
Complete these statements about the length of the book.

The lower limit for the length of the book is .....cm.

The upper limit for the length of the book is .....cm.

[2]

- 4 The diagram shows two straight lines crossing a pair of parallel lines.



Here are some statements about angle  $a$ .

Tick (✓) the **two** correct statements.

Angle  $a$  is corresponding to angle  $b$ .

Angle  $a$  is alternate to angle  $c$ .

Angle  $a$  is equal to angle  $d$ .

Angle  $a$  is vertically opposite to angle  $e$ .

[1]

5 (a) Find the size of each interior angle in a regular pentagon.

.....° [2]

(b) The cross-section of a prism is a regular pentagon.

Draw a ring around the number of planes of symmetry of the prism.

1

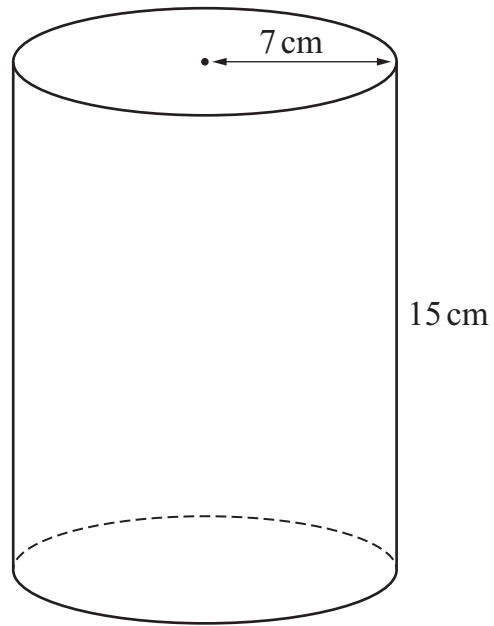
2

5

6

[1]

- 6 A cylinder has a radius of 7 cm and a height of 15 cm.



NOT TO  
SCALE

Calculate the volume of the cylinder.

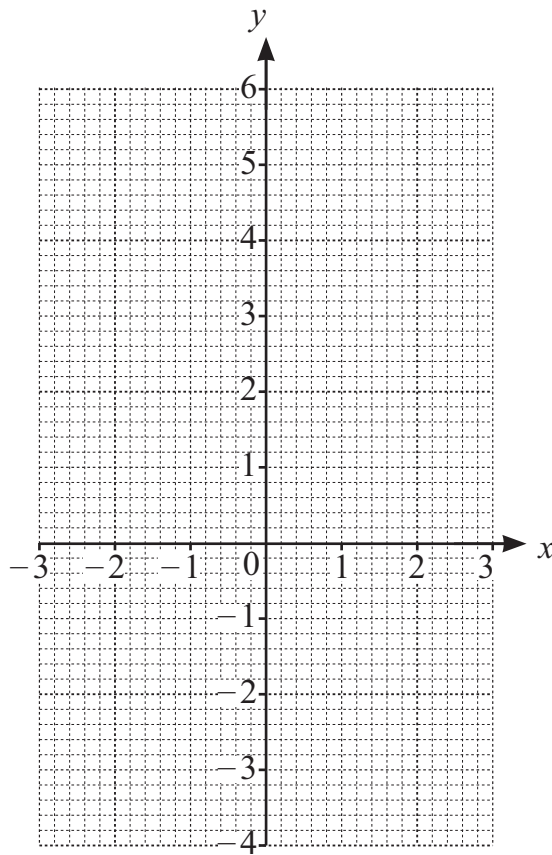
.....  $\text{cm}^3$  [2]

7 (a) Complete the table of values for  $y = x^2 - 4$

$x$	-3	-2	-1	0	1	2	3
$y$		0		-4	-3	0	

[1]

(b) Draw the graph of  $y = x^2 - 4$  for values of  $x$  between -3 and 3

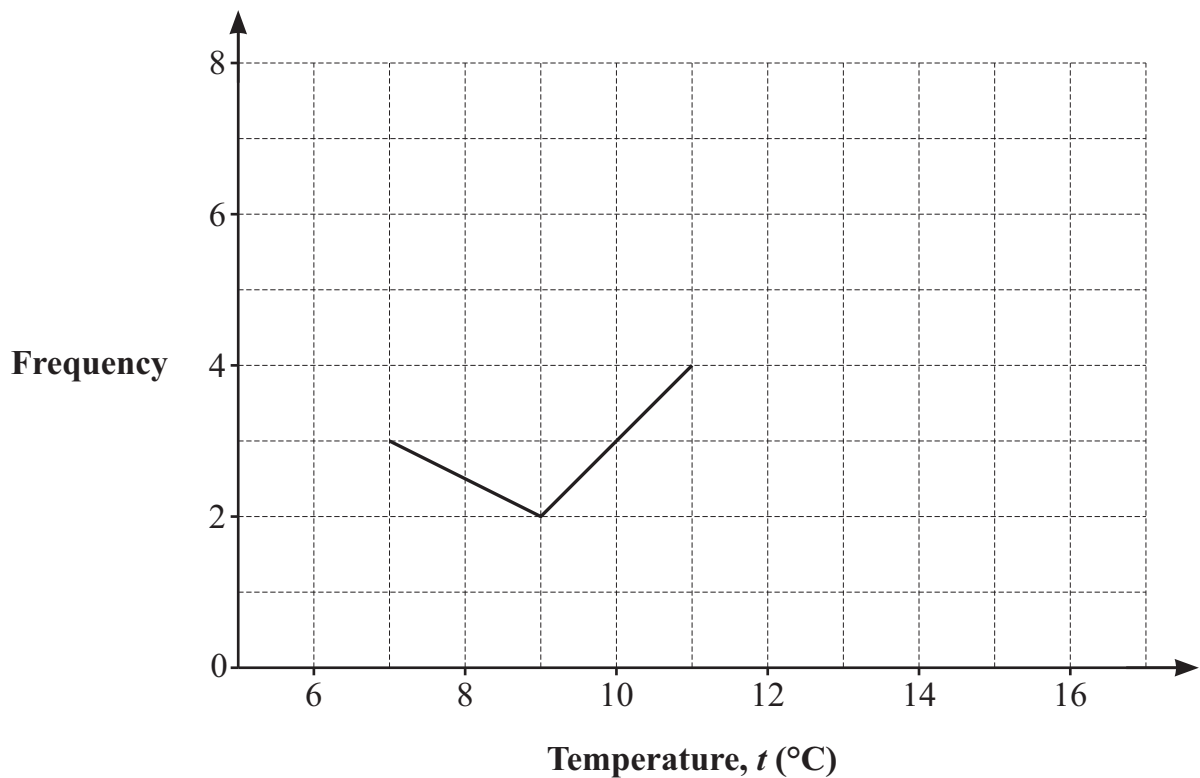


[2]

8 The table shows information about the temperatures in 20 cities one day.

Temperature, $t$ ( $^{\circ}\text{C}$ )	Frequency
$6 \leq t < 8$	3
$8 \leq t < 10$	2
$10 \leq t < 12$	4
$12 \leq t < 14$	3
$14 \leq t < 16$	8

(a) Complete the frequency polygon to show this information.



[1]

(b) Put a ring around the interval that contains the median temperature.

$6 \leq t < 8$      $8 \leq t < 10$      $10 \leq t < 12$      $12 \leq t < 14$      $14 \leq t < 16$

[1]

(c) Find the greatest possible value of the range of the temperatures.

..... $^{\circ}\text{C}$  [1]

9 (a) Here are the equations of some straight line graphs.

$$y = x + 2$$

$$y = 2x - 3$$

$$2y = x - 3$$

$$x = 2$$

Draw a ring around the graph with gradient 2

[1]

(b) Yuri's teacher asks him to write down three properties that the graphs of  $y = 2x + 1$  and  $y = 6x + 1$  **both** have in common.

Yuri has written down two properties.

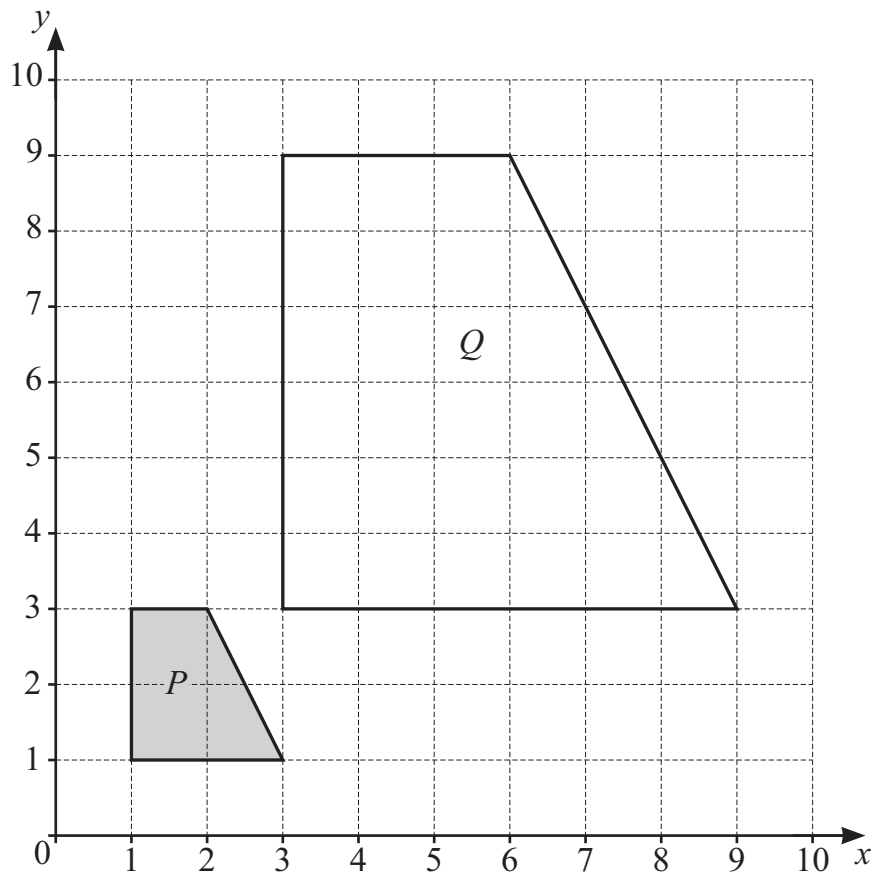
<p>1 They are both straight lines.</p> <p>2 They both have a positive gradient.</p> <p>3 .....</p> <p>.....</p>
---

Complete Yuri's list by writing down another property the two graphs **both** have in common.

[1]



10 The diagram shows two shapes on a grid.



Shape  $Q$  is an enlargement of shape  $P$ .

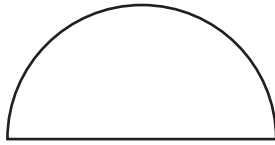
(a) Write down the scale factor of this enlargement.

..... [1]

(b) Find the centre of the enlargement.

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

- 11 The diagram shows a semi-circle with a radius of 12.3 cm.



NOT TO  
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Calculate the perimeter of the semi-circle.

..... cm [3]

- 12 It takes 5 workers 300 minutes to decorate some cakes.

Find how many minutes it would take 12 workers to decorate the same number of cakes.

..... minutes [2]

13 The table shows the prices of two laptops.

Laptop A	\$650
Laptop B	\$760

The price of Laptop A increases by 12%.

The price of Laptop B **decreases** by 5%.

Tick (✓) to show which laptop is more expensive after these changes.

Laptop A  Laptop B

Show how you worked out your answer.

[3]

- 14 The  $n$ th term of a sequence is  $n^2 + a$ .  
The 6th term of the sequence is 29

Find the sum of the first 4 terms.

..... [3]

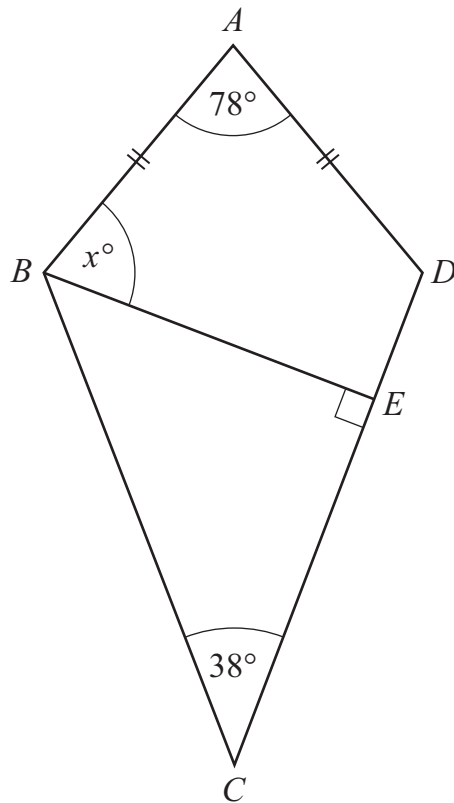
- 15 Make  $t$  the subject of the formula  $w = \frac{2t}{5} - 1$

$t =$  ..... [2]

- 16 Show that  $4y(5 - 9y) + 6y(6y - 1)$  simplifies to  $14y$ .

[2]

- 17  $ABCD$  is a kite.  
 $E$  is a point on  $CD$ .



NOT TO  
SCALE

Calculate the value of  $x$ .

..... [3]

- 18** Rajiv sells balloons that are coloured either red, green, blue or yellow.  
A customer is given a balloon at random.

25% of the balloons are red.

The probability that a customer is given a green balloon is 0.05

A customer is twice as likely to be given a blue balloon as a green balloon.

Calculate the probability that the balloon is yellow.

You may use the table to help you.

Colour	Red	Green	Blue	Yellow
Probability				

..... [2]

- 19** Bag A contains 56 counters.

The counters in Bag A are shared between Angelique and Hassan in the ratio 3 : 5

Bag B also contains some counters.

The counters in Bag B are shared between Angelique and Hassan in the ratio 4 : 3

In total Angelique receives 45 counters.

Find the number of counters in total in Bag B.

..... [3]

20 The table gives some information about the distances jumped by a group of boys and by a group of girls.

	Boys	Girls
<b>Mean</b>	3.36 metres	3.18 metres
<b>Range</b>	1.52 metres	1.05 metres

Mia writes these comparisons of the distances jumped by the boys and the girls.

- 1 The boys have a larger mean than the girls.
- 2 The boys have a larger range than the girls.

Mia’s teacher tells her that her comparisons would be better if she wrote them in context.

Write improved comparisons of the distances jumped by the boys and the girls.

1 .....

.....

2 .....

.....

[2]

21 Gabriella is a music teacher.  
 She wants to know if children in her school like music.  
 She asks a sample of children from the school orchestra if they like music.

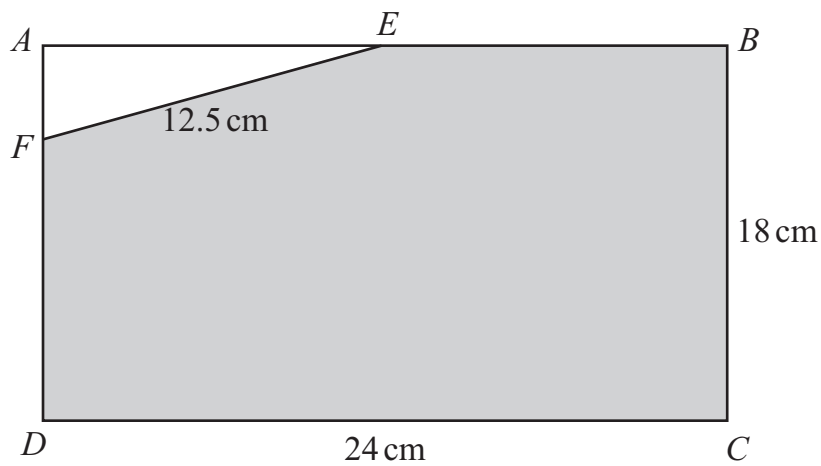
Explain why the data Gabriella collects is likely to be biased.

.....

.....

..... [1]

22 The diagram shows a rectangle  $ABCD$ .



NOT TO  
SCALE

$E$  is the midpoint of  $AB$ .

$EF = 12.5$  cm.

Calculate the shaded area.

.....  $\text{cm}^2$  [4]