Cambridge Assessment International Education

Cambridge Lower Secondary Progression Test

Mathematics paper 2

Stage 9

9404906644

55 minutes

For Teacher's Use	
Page	**Mark**
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14	
Total	

Name .....

Additional materials: Calculator
Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Answer **all** questions in the spaces provided on the question paper.

Calculator allowed.

You should show all your working on the question paper.

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 45.

For Teacher's Use

1 20 litres of petrol costs \$48.40

Work out the cost of 36 litres of the petrol.

\$..... [2]

2 Factorise.

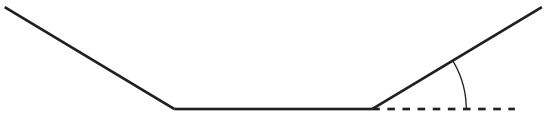
(a) $18a - 12$

..... [1]

(b) $2c^2 + 5c$

..... [1]

3 The diagram shows part of a regular polygon with 10 sides.



NOT TO SCALE

(a) Calculate the exterior angle of the polygon.

.....° [1]

(b) Calculate the interior angle of the polygon.

.....° [1]

4 Yuri makes a data collection sheet to find the heights of students in his school. He trials his data collection sheet with 15 students and gets these results.

For Teacher's Use

Height to the nearest centimetre	Tally	Frequency
1–50		0
51–100		0
101–150	𝍸 |	6
151–200	𝍸 ||||	9
201–250		0

Yuri wants to improve his data collection sheet.

Complete the **first** column with more suitable intervals.
You may not need to use all the rows of the table.

Height to the nearest centimetre

[1]

5 Tick (✓) to show if these statements are true or false when $x = 3.5$

$x^2 + 2 < 14$ True ☐ False ☐

$10x - 2 \geqslant 33$ True ☐ False ☐

[1]

[Turn over

For Teacher's Use

6 Write as a power of n.

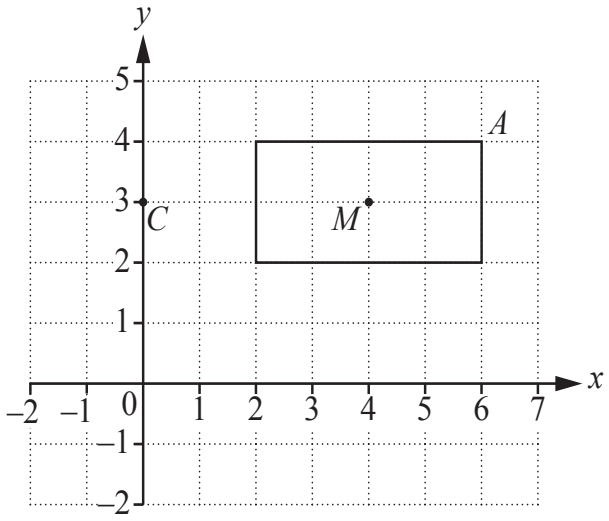
(a) $n \times n^2$

..... [1]

(b) $n^3 \div n^2$

..... [1]

7 This is a rectangle on a coordinate grid.



(a) The rectangle is enlarged with a scale factor of 2
The centre of the enlargement is C (0, 3).

Find the coordinates of the image of vertex A.

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

(b) The rectangle is rotated 90° clockwise about the point M (4, 3).

Find the coordinates of the image of vertex A.

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

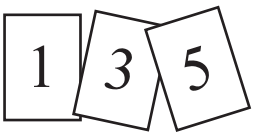
8 A car travels 230 km.
It uses 18.5 litres of petrol.

Calculate the distance travelled per litre of petrol for this car.
Give your answer in km / *l*.

For Teacher's Use

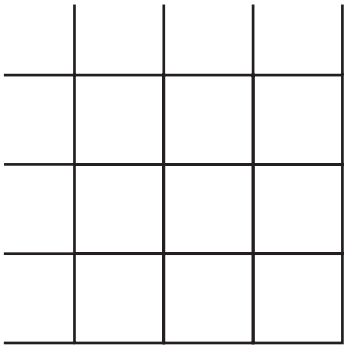
..... km / *l* [1]

9 Jamila has two sets of number cards.



She takes **one** card from each set.
She multiplies the numbers on her two cards.

Show the possible outcomes in the sample space diagram.



[2]

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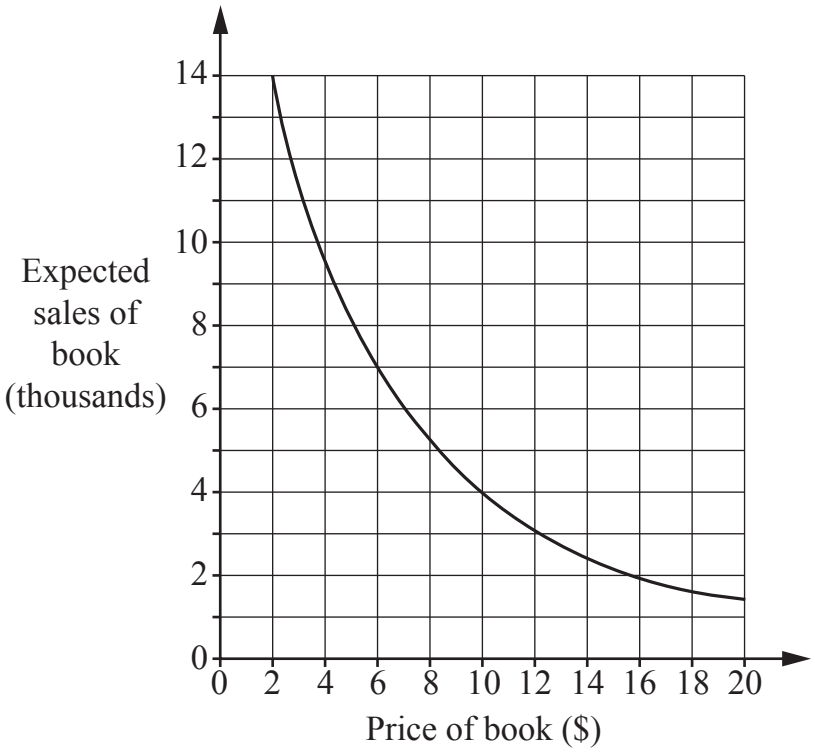
10 A publisher is deciding how much to charge for a new book.
Carlos draws this graph to show how the expected sales of the book change with the price.



(a) Describe how the expected sales vary with price.

.....

..... [1]

(b) Work out how many more books the publisher would sell by charging $6 for the book instead of $12

.....thousand [2]

11 One solution to $x^2 + 4x = 25$ is between 3 and 4

For Teacher's Use

Use trial and improvement to find this solution.
Give your answer correct to 1 decimal place.
Show your working.
You may not need all the rows in the table.

x	$x^2 + 4x$	**Comment**
3	$3^2 + 4 \times 3 = 21$	Too small
4	$4^2 + 4 \times 4 = 32$	Too big

x = ... [3]

For Teacher's Use

12 The cost of a holiday **last year** is shown.

Hotel:	\$1300
Flights:	\$ 900
Total cost:	\$2200

The cost of the hotel **this year** is 8% more expensive than last year.
The cost of flights this year is \$961

Work out the percentage increase in the total cost of the holiday.

.....% [3]

13 Solve this equation.

$5(c + 32) = 60$

c = ... [2]

For Teacher's Use

14 Hassan produces apple juice using apples grown on his farm.
He has 180 apple trees.
Each tree produces 40 kilograms of apples per year.

To make 1 litre of apple juice, Hassan needs 2.5 kilograms of apples.
He sells his apple juice in 0.75 litre bottles.

Work out how many bottles of apple juice Hassan can expect to produce in one year.

..... bottles [3]

15 **(a)** Calculate.

$$\frac{59.5 + 37.4}{59.5 - 37.4}$$

Write down all the digits on your calculator display.

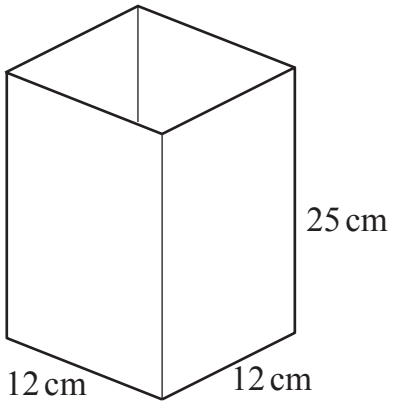
..... [1]

(b) Round your answer to 2 significant figures.

..... [1]

[Turn over

16 A container for water is in the shape of a cuboid.



NOT TO SCALE

Calculate the capacity of the container, **in litres**.

..... litres [2]

17 The average speed for three of the journeys described below is the same.

Journey A: 180 km in 3 hours	Journey B: 140 km in 2.5 hours
Journey C: 30 km in 0.5 hours	Journey D: 10 km in 10 minutes

Draw a ring around the journey that has a **different** average speed from the others. [1]

18 The diagram shows a cube drawn on isometric paper.

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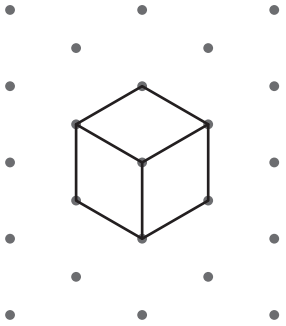
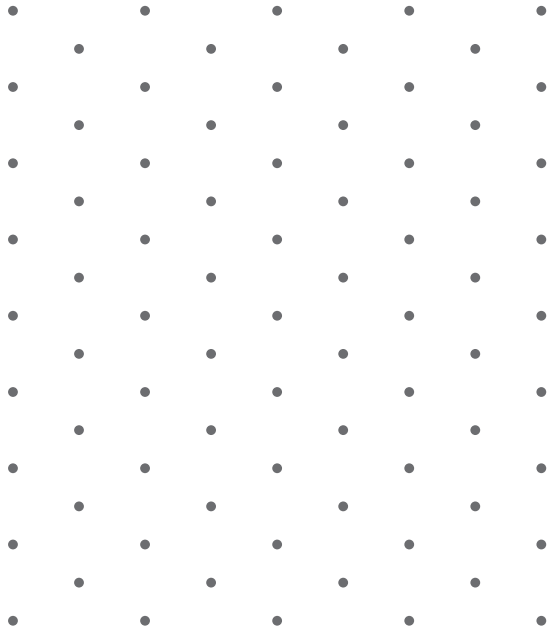


Eight of these cubes are put together to make a larger cube.

Draw this larger cube on the isometric paper.



[1]

19 Make t the subject of this formula.

$$r = 7(t + 3)$$

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

20 Nine students take a history exam and a geography exam.
Their marks out of 100 are:

History: 46, 65, 45, 42, 71, 48, 50, 71, 51
Geography: 43, 72, 50, 68, 77, 64, 74, 78, 50

(a) Complete the back to back stem-and-leaf diagram.

History					Geography
8	6	5	2	4	3
		1	0	5	
			5	6	
		1	1	7	

Key: 2 | 4 | 3 = 42 in history and 43 in geography

[2]

(b) Use the shapes of the distributions to compare the marks for history and geography.

.....

..... [1]

For Teacher's Use

21 Manjit thinks of a factor of 24
Gabriella thinks of a multiple of 13
The square of Manjit's number is 3 less than Gabriella's number.

Work out the numbers that Manjit and Gabriella thought of.

Manjit's number = ...

Gabriella's number = ...
[2]

22 There are two different pairs of trainers in a sale, Alpha trainers and Bargain trainers.

Alpha trainers
Original price: $50
Sale price: $44

Bargain trainers
Original price: $30
Sale price: $24

Rajiv says, 'The discount on the Bargain trainers is better.'

Explain why Rajiv is correct.

.....

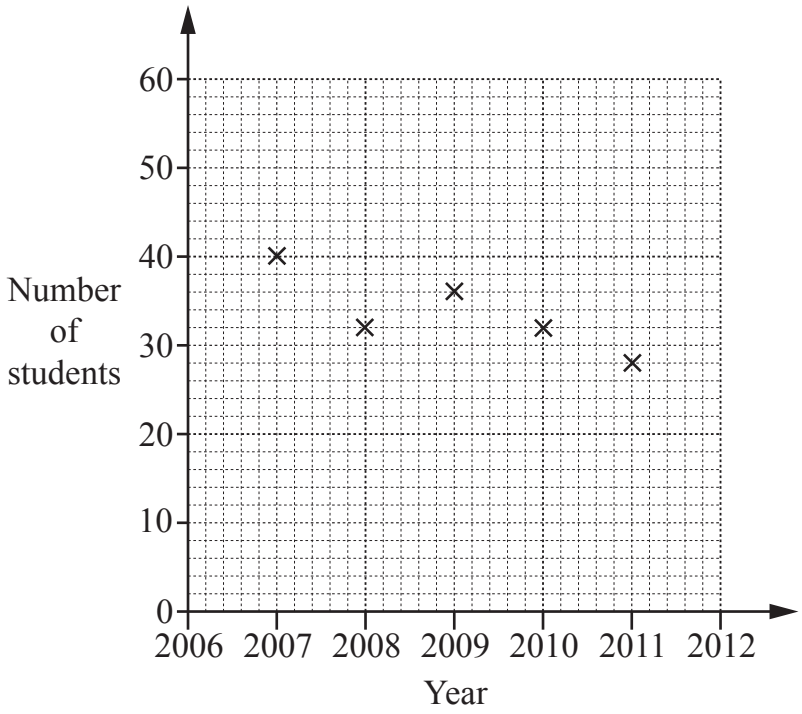
.....

..... [1]

[Turn over

23 The graph shows the number of students gaining the top grade in a mathematics exam each year.

For Teacher's Use



Between 2011 and 2012 there was a 50% increase in the number of students gaining the top grade.

Show this on the graph. [2]