**Cambridge Secondary 1 Progression Test**
Question paper

Cambridge Secondary 1

**55 minutes**

# Mathematics Paper 2

## Stage 8

*4669762235*

Name .....

Additional materials: Ruler
Calculator
Tracing paper
Geometrical instruments

**READ THESE INSTRUCTIONS FIRST**

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

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 | |
|---|---|
| **Page** | **Mark** |
| **1** | |
| **2** | |
| **3** | |
| **4** | |
| **5** | |
| **6** | |
| **7** | |
| **8** | |
| **9** | |
| **10** | |
| **11** | |
| **12** | |
| **13** | |
| **14** | |
| **Total** | |

DC (CW/SW) 90759/12RP


CAMBRIDGE International Examinations

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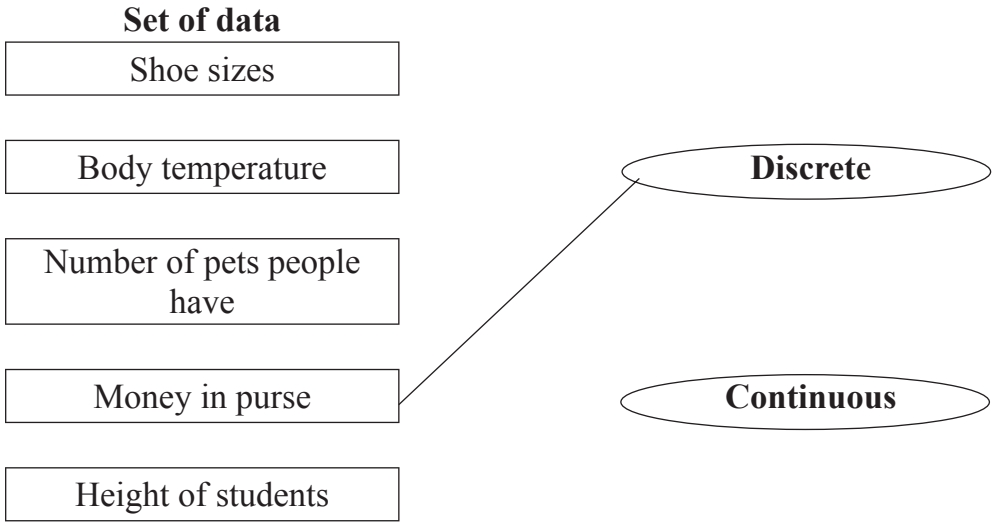
**1** Put a ring around the expression that is equivalent to $m \times m \times m \times m \times m$

$5m$ $\quad$ $m^5$ $\quad$ $\frac{m}{5}$ $\quad$ $5^m$

[1]

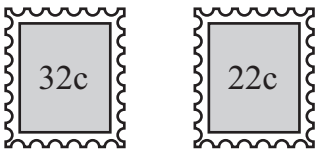
**2** Draw a line from each set of data to its description.

One is done for you.




[1]

**3** Sofia has to post a letter.
It will cost 150 cents.
She only has stamps worth 32 cents and 22 cents.




Work out the number of each type of stamp she should use to make a total of 150 cents.

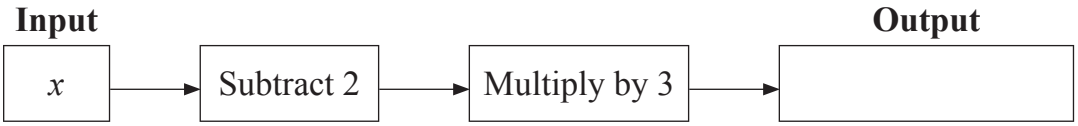
Number of 32 cents stamps ..... Number of 22 cents stamps ..... [2]

**4** Round 203.497 correct to

**(a)** the nearest whole number ..... [1]

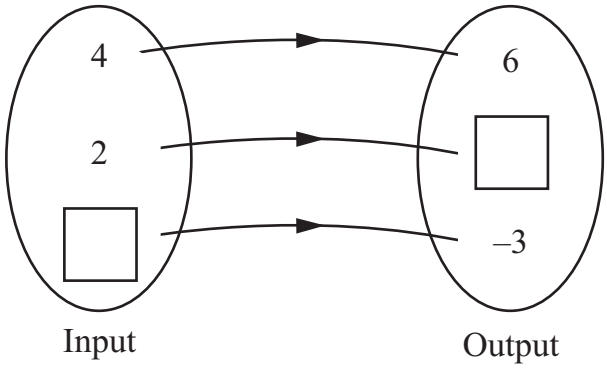
**(b)** two decimal places. ..... [1]

**5** Here is the rule for a function.




**(a)** Write an expression in terms of $x$ for the output.
Write your answer in the output box. [1]

**(b)** Complete the mapping diagram for the function.




[1]

**6** Put a ring around the equation of a diagonal straight line.

$y = 7$ $y = 0$ $y = 4x$ $x = 3$

[1]

**7** The cost of 8 identical pens is 96 cents.

How much do 5 of these pens cost?

..... cents [1]

**8** **(a)** A newspaper says that there are 74 000 horses in a country.
The number 74 000 is the actual number of horses rounded to the nearest thousand.

Put a ring around the numbers that could be the actual number of horses.

74 511 74 475 75 000 73 496

73 000 70 000 73 627 [1]

**(b)** The number of cats in a city is exactly 93 200
The number of cats is increasing by 7% a year.

How many cats will there be in total in one year's time?

..... [2]

**9** A circle has a radius of 4.5 cm.

**(a)** Find the circumference.

..... cm [2]

**(b)** Find the area.

..... $cm^2$ [2]

**10** **(a)** Complete the table of values for the equation $y = 5 - 2x$

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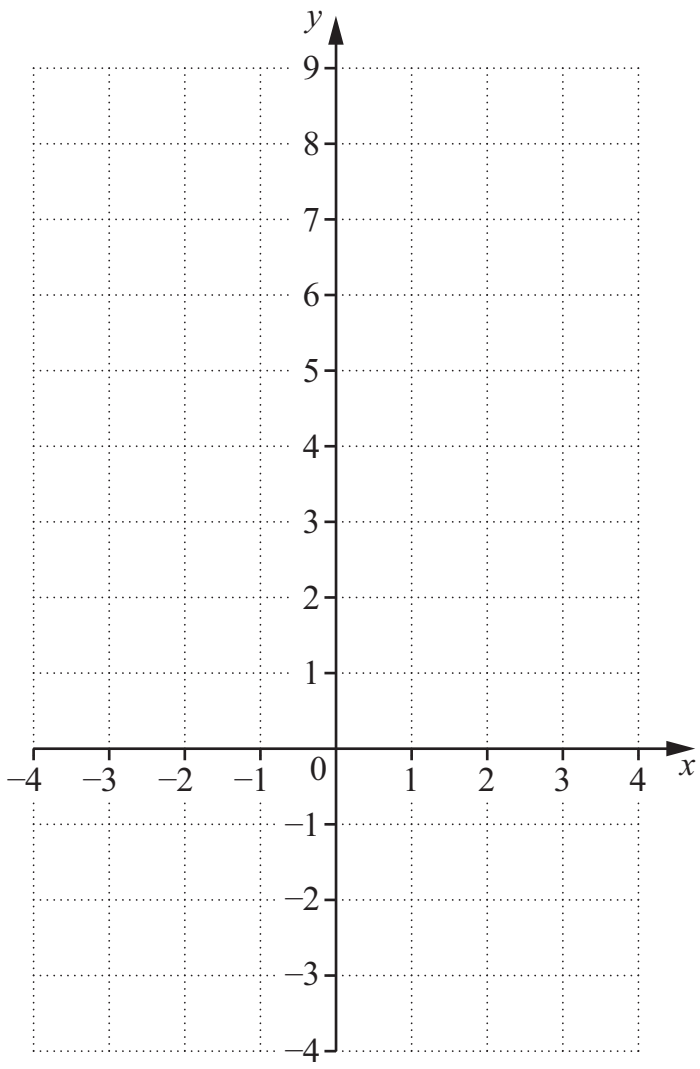
| $x$ | –2 | –1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| $y$ | | 7 | | | 1 | | –3 |

[1]

**(b)** Plot the points on the grid and draw the line $y = 5 - 2x$




[1]

**11** In a triangle, $AB = 10$ cm, $BC = 6$ cm and $AC = 9$ cm.

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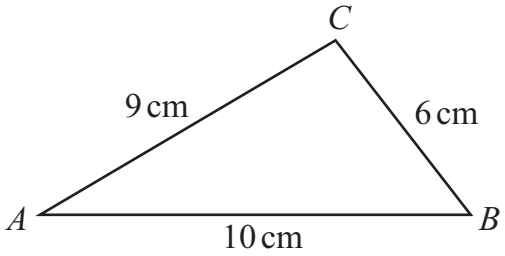


NOT TO SCALE

Construct the triangle $ABC$.
Leave in all your construction lines.

[2]

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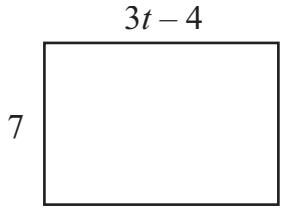
**12** The diagram shows a rectangle.
All lengths are measured in centimetres.




NOT TO SCALE

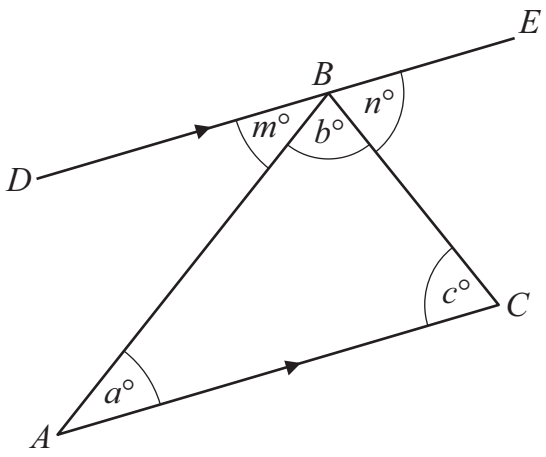
**(a)** Write an expression for the area of the rectangle. .....cm$^2$ [1]

**(b)** The area of the rectangle is 56 cm$^2$.

Work out the value of $t$.

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

**13** Here is part of a proof showing that the sum of angles in a triangle is 180°.
Complete the proof by filling in the missing reasons.




Lines $AC$ and $DE$ are parallel.

$m° + b° + n° = 180°$ because .....

$m° = a°$ because .....

$n° = c°$ because .....

So $m° + b° + n° = a° + b° + c° = 180°$ [2]

**14** Tom is in a diving competition.

**(a)** The **score**, $S$, for a dive is 60% of the **total mark**, $m$, multiplied by the **difficulty factor** of the dive, $d$.

Write down the formula for calculating $S$ in terms of $m$ and $d$.

$S =$ ..... [1]

**(b)** Here are the judges' marks for one of Tom's dives.

| **Judge** | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| **Marks** | 6.7 | 7.4 | 7.7 | 6.6 | 6.1 | 7.2 | 7.3 |

To work out the **total mark**, $m$, for a dive cross out the lowest mark and the highest mark, then add the remaining 5 marks together.

What is Tom's **total mark**, $m$, for this dive?

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

**(c)** The difficulty factor, $d$, of Tom's dive is 3.5

Use your answers to part **(a)** and **(b)** to work out the **score**, $S$, for Tom's dive.

$S =$ ..... [1]

**15** Here are the names of four quadrilaterals.

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Rectangle Square Kite Rhombus

Use these names to complete fully each column in the table.
Names may be used more than once.

| opposite sides parallel | opposite sides parallel **and** all sides equal lengths | opposite sides parallel **and** all sides equal lengths **and** diagonals different lengths |
|---|---|---|
| | | |
| | | |
| | | |

[2]

**16** Suresh and Monty both took part in seven cricket matches.

This table shows the number of runs **Suresh** scored in these matches.

| **Match** | Match 1 | Match 2 | Match 3 | Match 4 | Match 5 | Match 6 | Match 7 |
|---|---|---|---|---|---|---|---|
| **Runs** | 22 | 38 | 13 | 29 | 36 | 40 | 25 |

The mean and range of the number of runs scored by **Monty** are

Mean = 33 runs
Range = 17 runs

**(a)** Which of these two players scored more runs on average?
Show your working.

[2]

**(b)** Whose runs were more spread out?
Show your working.

[1]

**17** **(a)** Write 504 as a product of its prime factors.

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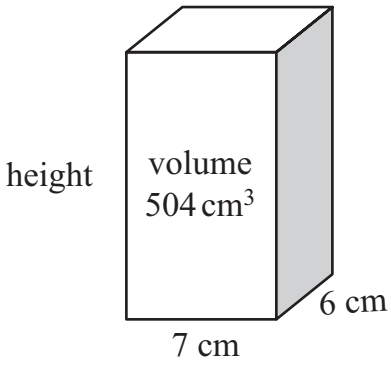
..... [1]

**(b)** A cuboid carton has a volume of 504 $cm^3$.




NOT TO SCALE

**(i)** The carton base has edges of length 6 cm and 7 cm.

Find the height of the carton.

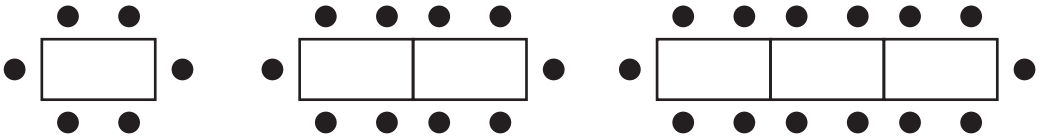
..... cm [1]

**(ii)** The carton contains juice.
The volume of the **juice** in the carton is 420 $cm^3$.

What percentage of the carton's volume is juice?

..... % [2]

**18** The diagrams show a pattern of seats and tables joined in a row.



1 table 2 tables 3 tables

Key: ▭ = table ● = seat

**(a)** Fill in the missing value below when four tables are joined in a row.

| **Number of tables joined in a row** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Number of seats** | 6 | 10 | 14 | |

[1]

**(b)** The expression for the number of seats at $n$ tables joined in a row is $4n + 2$

**(i)** Work out the number of seats when 15 tables are joined in a row.

..... [1]

**(ii)** Explain where the numbers in the expression, $4n + 2$, come from by referring to the number of tables and arrangement of seats.

.....

.....

.....

..... [1]

**19** Find the midpoint of the line segment $AB$ where $A$ is $(-8.5, 4)$ and $B$ is $(6.5, -7)$.

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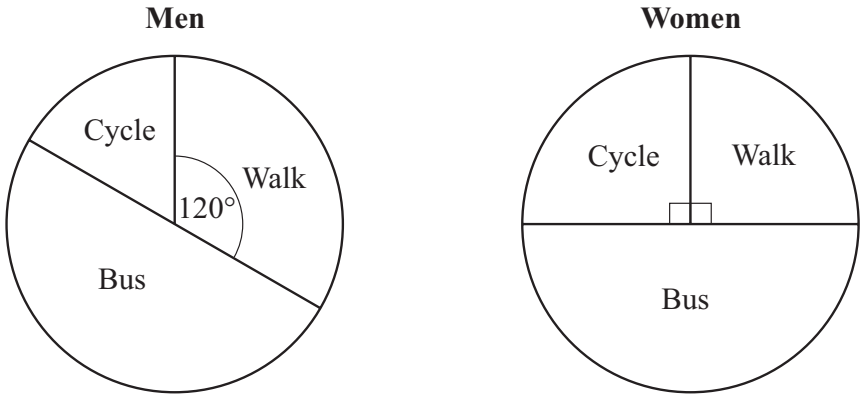
(..... , .....) [2]

**20** In a survey, 150 men and 240 women were asked how they got to work.

Here are the results.




**(a)** Anastasia thinks that the same number of men and women took a bus to work.

Is Anastasia correct?

Tick (✓) a box Yes ☐ No ☐

Explain your answer.

.....

..... [1]

**(b)** There were 50 men that walked to work.

What is the difference between the number of men that walked to work and the number of women that walked to work?

.....people [1]

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