

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

Paper 2

1112/02

April 2019

1 hour

Candidates answer on the Question Paper.

Additional Materials: Calculator
Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Calculator allowed.

You should show all your working in the booklet.

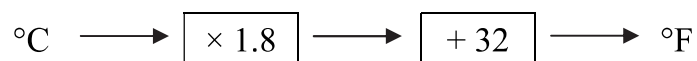
The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 50.

This document consists of **16** printed pages.

- 1 Temperature can be measured in degrees Celsius ($^{\circ}\text{C}$) or degrees Fahrenheit ($^{\circ}\text{F}$).

Here is a function to change degrees Celsius to degrees Fahrenheit.



- (a) Use the function to change 25°C to $^{\circ}\text{F}$.

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

- (b) Complete the inverse function.



[1]

- 2 Work out

$$\frac{14^2 + 29}{3 \times 2^2 - 7}$$

..... [1]

- 3 A teacher keeps a record of how many times Mike arrives late to school.
The results are shown in the tally chart.

	Tally
Late	
On time	

Use the results to estimate the probability that Mike arrives late to school.
Draw a ring around your answer.

$$\frac{1}{15} \quad \frac{5}{15} \quad \frac{1}{2} \quad \frac{3}{4}$$

[1]

- 4 (a) The population of a city is 248 675

Round the population to the nearest thousand.

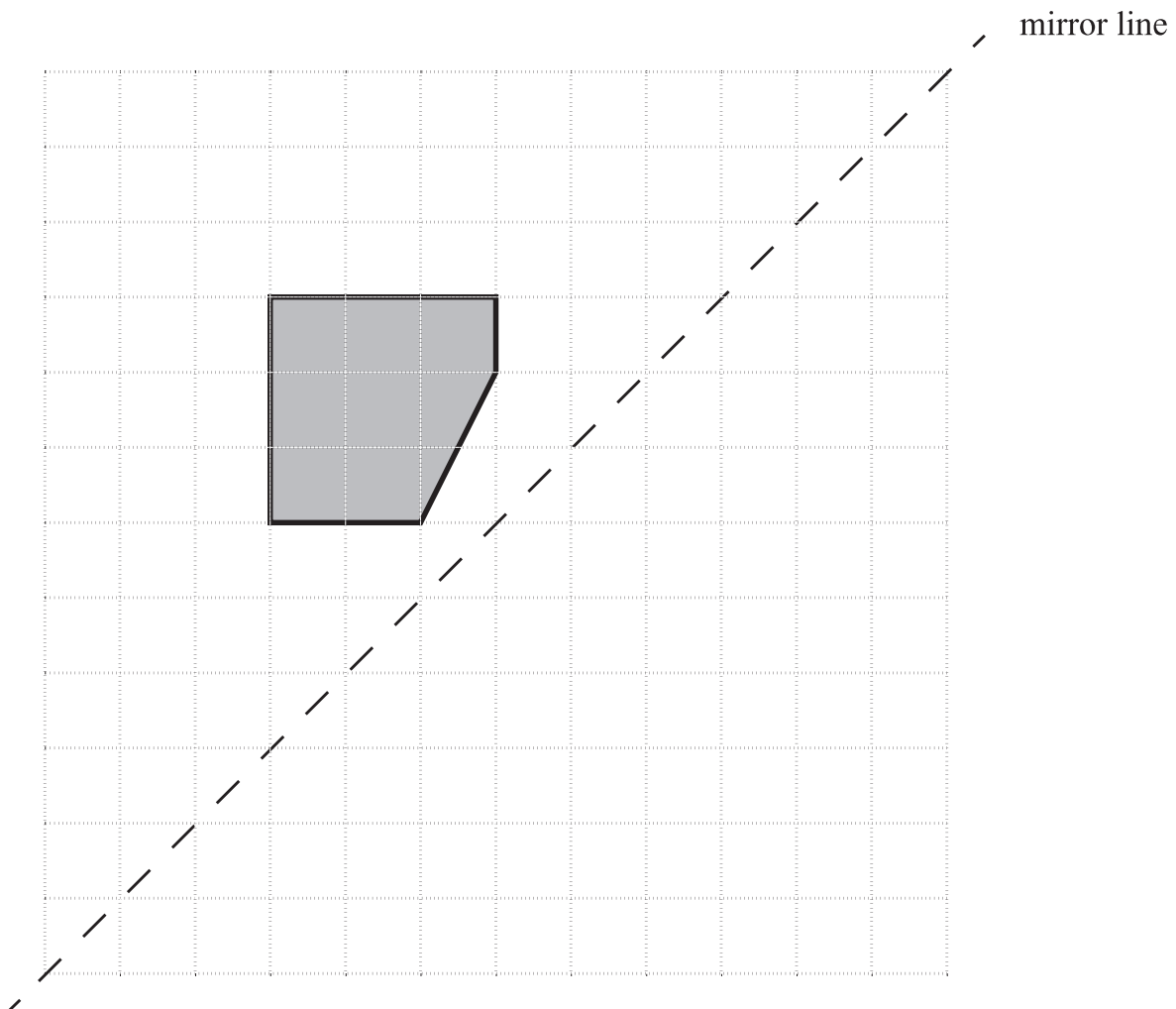
..... [1]

- (b) The city covers an area of 52.747 square kilometres.

Round the area to one decimal place.

..... square kilometres [1]

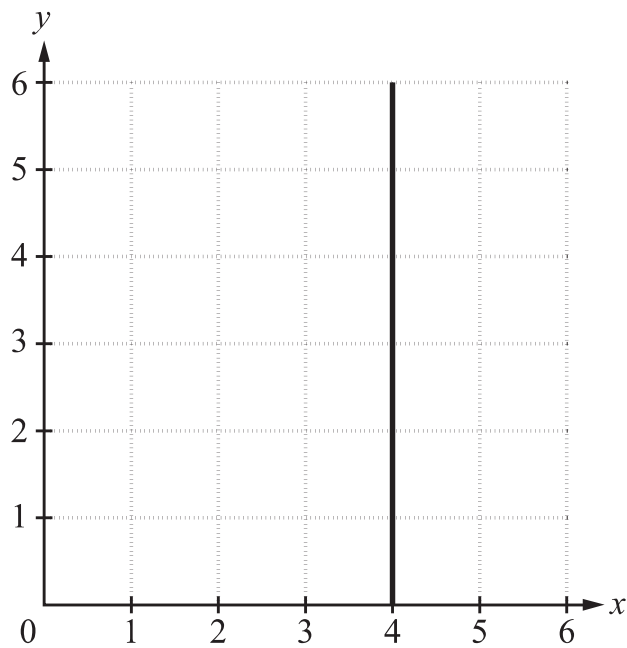
- 5 The diagram shows a shape drawn on a square grid.



Reflect the shape in the mirror line.

[2]

6 A line is drawn on a grid.



(a) Draw a ring around the equation of the line.

$x = 4$

$y = 4x$

$y = 4$

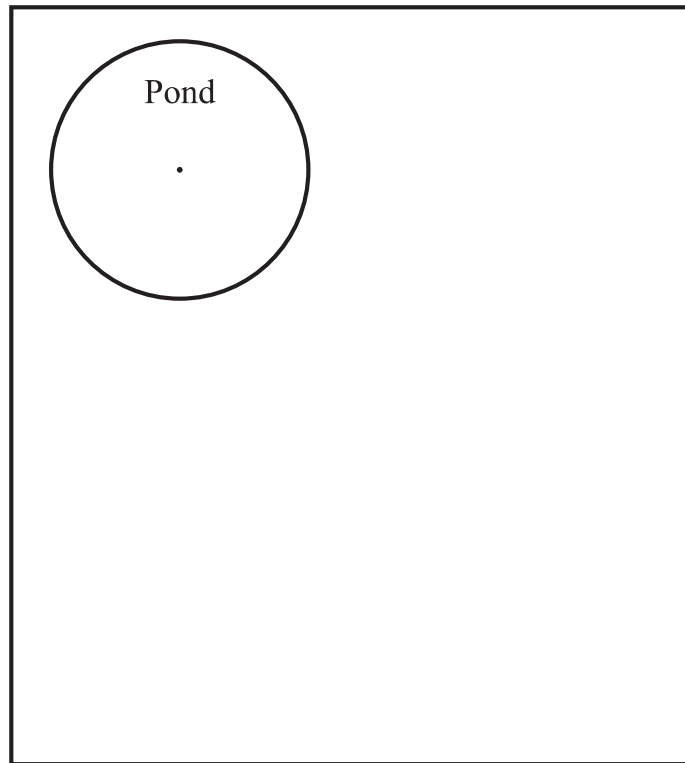
$x + y = 4$

[1]

(b) Draw the line $y = 2$ on the grid.

[1]

- 7 This is a scale drawing of a garden.



Scale: 1 centimetre represents 2 metres

- (a) There is a circular pond in the garden.

By measuring, find the **diameter** of the pond in real life.

..... metres [1]

- (b) The owners want to build a shed in the garden.
The shed measures 3 metres by 4 metres.

Draw the shed on the diagram.

[1]

- 8 Carlos swims 90 lengths of a swimming pool.
The swimming pool is 25 m long.

- (a) Work out the total distance Carlos swims.
Give your answer in kilometres.

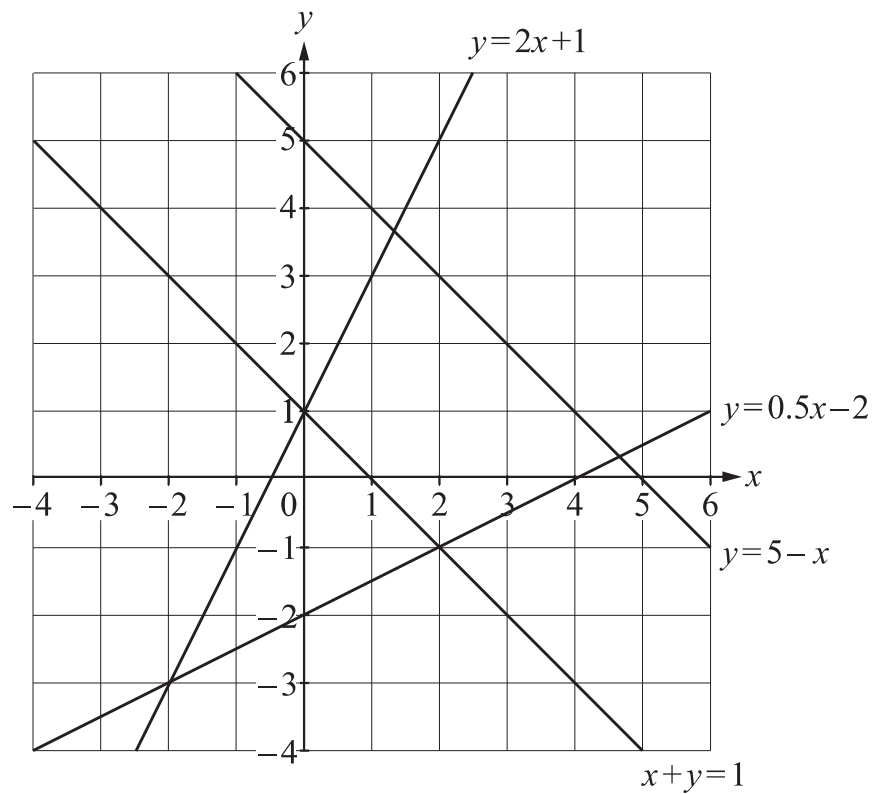
..... km [2]

- (b) Carlos either swims on his front or on his back.
He swims lengths on his front and on his back in the ratio of 4 : 1

Work out the number of lengths Carlos swims on his **front**.

..... [2]

9 The graph shows four straight lines.



(a) Draw a ring around the equations of the **two** lines that do not intersect each other.

$$y = 2x + 1$$

$$y = 0.5x - 2$$

$$y = 5 - x$$

$$x + y = 1$$

[1]

(b) Write down the solution to these simultaneous equations.

$$y = 2x + 1$$

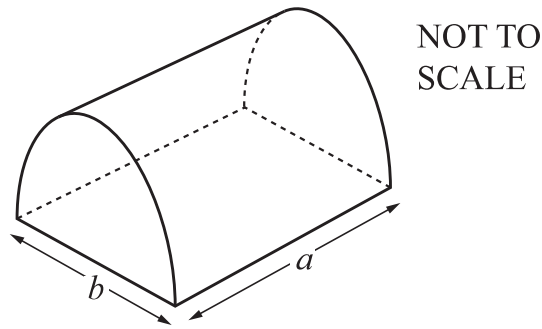
$$y = 0.5x - 2$$

$x =$

$y =$

[1]

10 This is a semicircular prism.



(a) Here are the instructions to calculate the area (S) of the curved surface of the prism.

Multiply a and b
then multiply by π
then divide by 2

Write down a formula for S in terms of a and b .

$S =$ [1]

(b) Here is a formula for the volume (V) of the prism.

$$V = \frac{\pi ab^2}{8}$$

Work out the volume of the prism when $a = 7.6$ cm and $b = 9.2$ cm.

..... cm^3 [2]

11 Pierre is solving the equation

$$x^2 + 4x = 56$$

using a trial and improvement method.

The table shows some of his working.

x	$x^2 + 4x =$	Too big or too small?
5	45	Too small
6	60	Too big
5.6	53.76	Too small
5.7	55.29	Too small
5.8	56.84	Too big
5.75		

(a) Complete the final row of the table.

[1]

(b) Write down the solution to the equation $x^2 + 4x = 56$ correct to one decimal place.

$x =$ [1]

12 Anastasia is a years old, Blessy is b years old and Manjit is m years old.

(a) Blessy is older than Manjit.

Draw a ring around the correct inequality.

$$b > m \qquad b \geq m \qquad b < m \qquad b \leq m$$

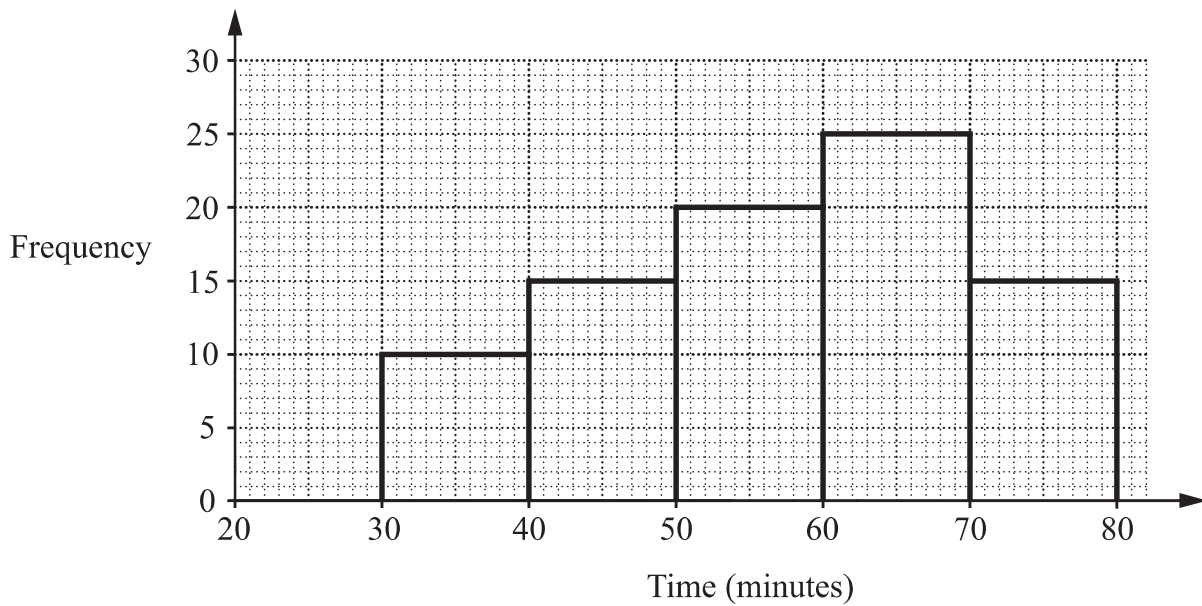
[1]

(b) Anastasia is less than half the age of Blessy.

Write this statement as an inequality.

..... [1]

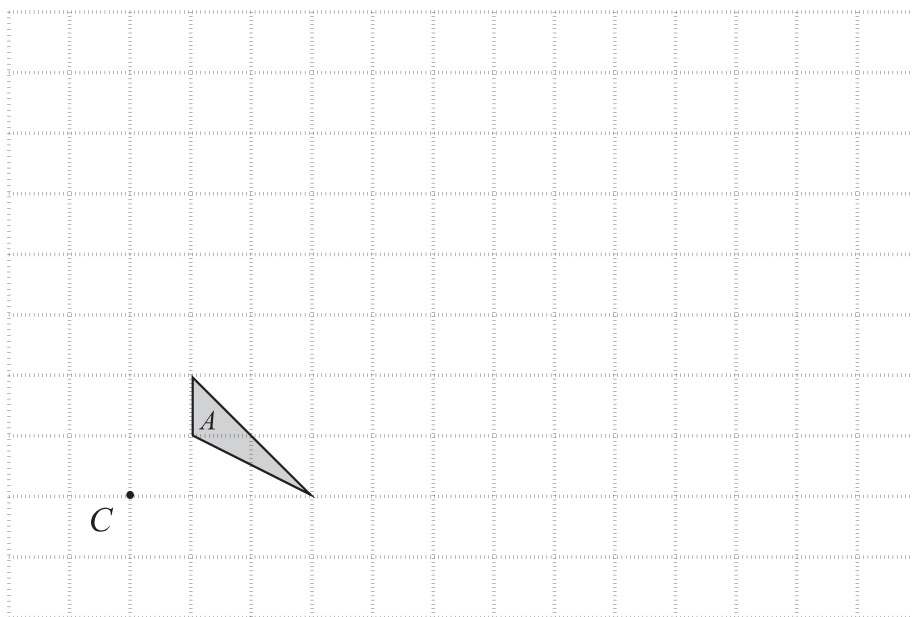
- 13 The chart shows information about the number of minutes 85 runners take to run ten kilometres.



Find the percentage of the runners that take less than one hour.

..... % [2]

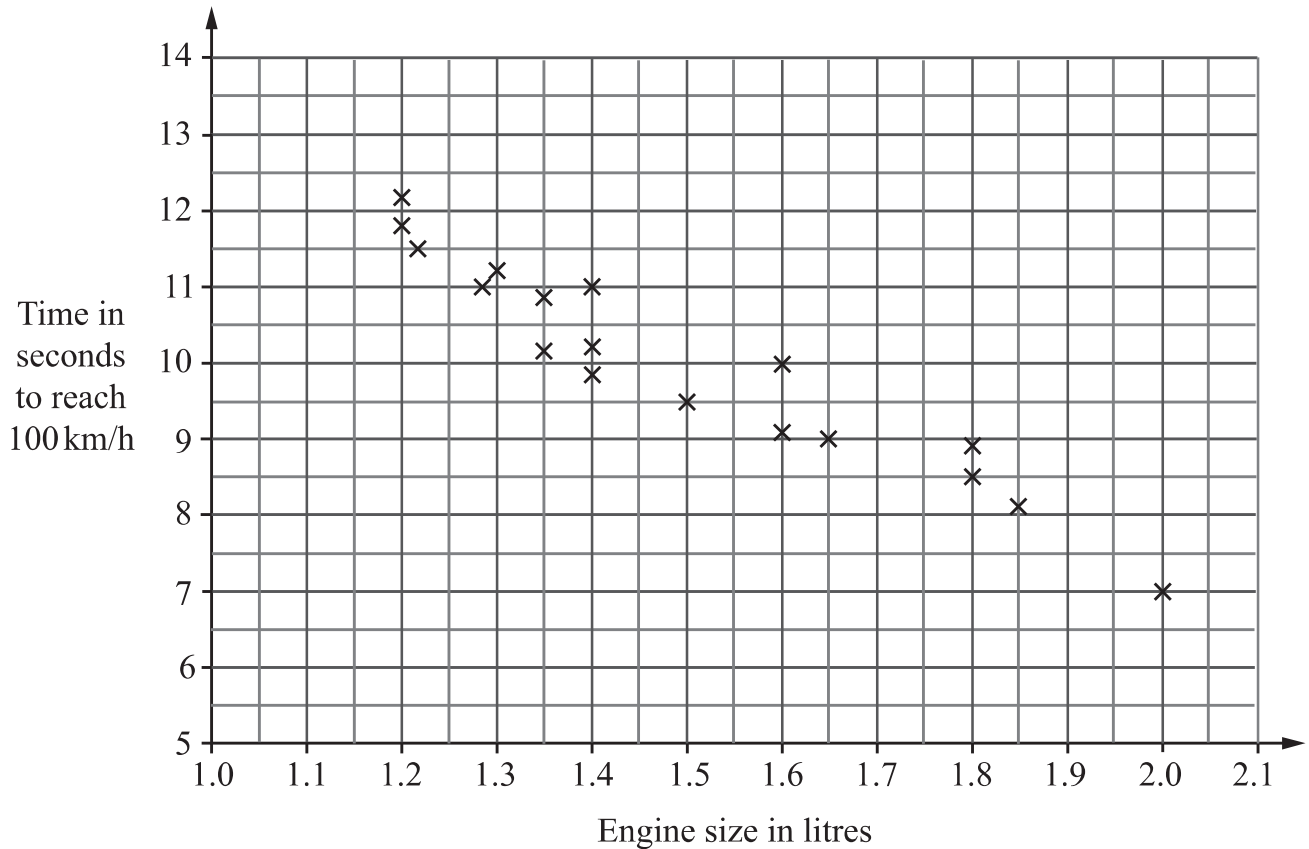
- 14 Draw the enlargement of triangle A with scale factor 3 and centre C .



[2]

- 15** Some cars are surveyed to compare engine size, in litres, with the time taken to reach a speed of 100 km/h.

The results are shown on the scatter graph.



- (a)** Another car has an engine size of 1.8 litres and takes 9.5 seconds to reach 100 km/h.

Add this data to the scatter graph.

[1]

- (b)** Use the graph to estimate the time taken by a car with engine size 1.7 litres.

.....seconds [1]

- 16** Here are four lengths.

0.075 km

7.6 m

77 cm

780 mm

Put them in order from smallest to largest.

.....
smallest

.....

.....

.....
largest

[2]

17 Chen is a lorry driver.

He earns a bonus if he drives at least 2.8 kilometres per litre of fuel.

The figures show some information about Chen's last journey.

Journey time	=	4.5 hours
Average speed	=	61 km/h
Amount of fuel used	=	96 litres

Work out whether Chen earned a bonus for this journey.

Put a tick (✓) in the correct box.

Chen earned a bonus

☐

Chen did not earn a bonus

☐

Show how you worked out your answer.

[2]

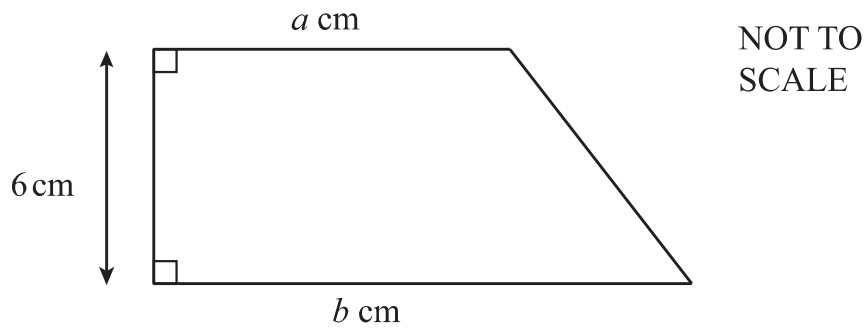
18 Decide if these statements are true or false.

Tick (✓) the correct boxes.

	True	False
2.3 kilograms \neq 23 000 grams	<input type="checkbox"/>	<input type="checkbox"/>
150 millilitres $<$ 0.3 litres	<input type="checkbox"/>	<input type="checkbox"/>
5000 millimetres $>$ 5 metres	<input type="checkbox"/>	<input type="checkbox"/>

[1]

- 19 The diagram shows a trapezium.



The area of the trapezium is 30 cm^2 .
 a and b are both whole numbers with $a < b$.

Work out one possible pair of values for a and b .

$a =$
 $b =$ [2]

- 20 A cinema records the ratio of children to adults in the audiences of two films shown last week.

	children : adults
Film A	11 : 19
Film B	5 : 7

Tick (✓) the film that has the greater proportion of children in the audience.

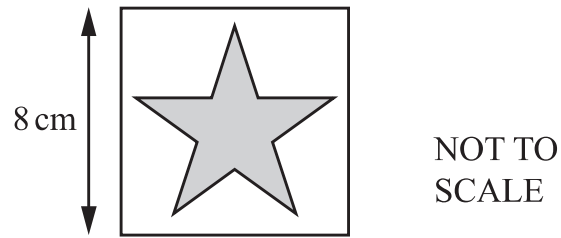
Film A ☐ Film B ☐

Show how you worked out your answer.

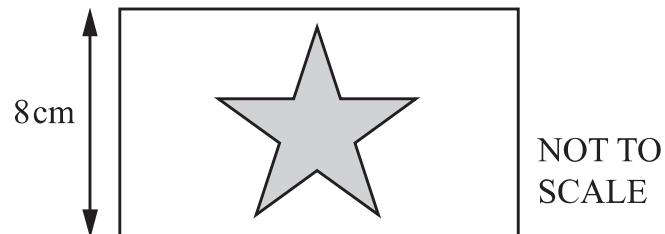
[2]

21 The diagram shows a star inside a square of side length 8 cm.

The star covers 40% of the area of the square.



The **same** star is placed inside a rectangle with width 8 cm.



The length of the rectangle is 60% longer than the width.

Calculate the percentage of the rectangle that the star covers.

..... % [3]

22 Draw a ring around the **largest** measurement in the list.

4200 cm³

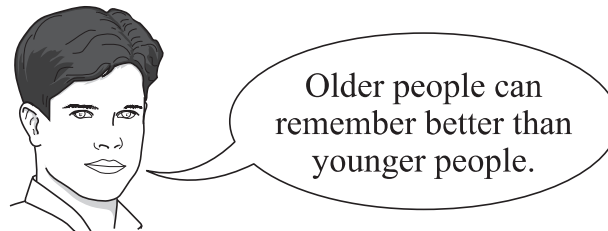
54 000 mm³

45 litres

52 000 ml

[1]

23 Youssef says,



Youssef does an experiment to see if this is true.

He shows 80 people six numbers and asks them to remember them.

He records if they can or cannot.

Here are the results.

Age	Number of people tested	Can remember	Cannot remember
11 to 20	20	16	4
21 to 30	20	14	6
31 to 40	40	26	14

Tick (✓) to show whether this evidence supports what Youssef says.

Yes ☐ No ☐

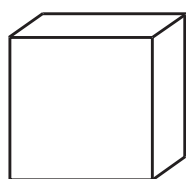
Give a reason for your answer.

.....

.....

..... [2]

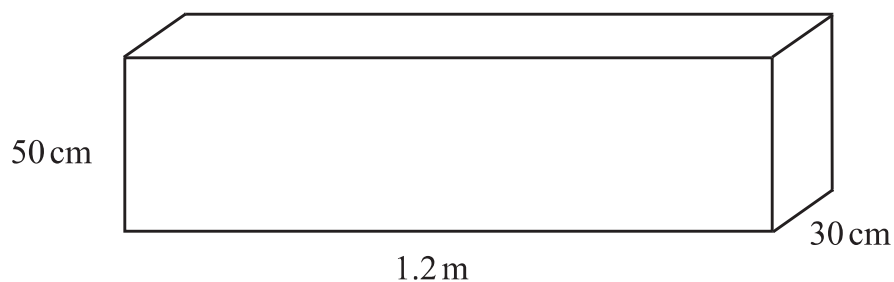
24 Cubes with side length 3 cm are packed into a larger cuboid box.



NOT TO
SCALE

3 cm

Work out how many of the cubes fit inside this box.



NOT TO
SCALE

..... [3]

25 The number 12.25 has two square roots.

Find them both.

..... and [1]

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