

NAME

Non-calculator

1 Work out $258 + 174 - 89$

.....
(2 marks)

2 Work out

a -3×12

.....
(1 mark)

b $-12 \div -3$

.....
(1 mark)

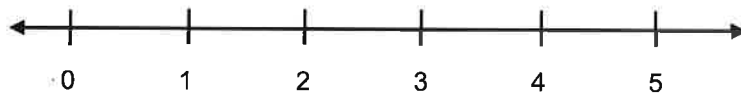
c -6×-7

.....
(1 mark)

d $64 \div -8$

.....
(1 mark)

3 Draw an arrow \downarrow pointing to the position of $\sqrt{6}$ on this number line.



(1 mark)

4 Copy and complete the long division to work out $40.56 \div 13$

$$\begin{array}{r}
 3 \\
 13 \overline{) 40.56} \\
 \underline{39} \\
 1
 \end{array}$$

\downarrow

(2 marks)

5 An art gallery hangs 7 small square pictures on a wall.

Each square picture has side length 11 cm.

a Write a calculation for the total area of the wall covered by pictures.

.....
(1 mark)

b Work out the area of the wall covered by pictures.

.....
(1 mark)

6 A flag flies at a height of 4.2 m.

The flag is lowered by 1.34 m, and then by a further 0.25 m.

Work out how high the flag flies now.

.....m
(2 marks)

7 What is the missing number in this calculation?

$$42 \div \square = -6$$

.....
(1 mark)

8 $3^3 + 5^2 = 2x$

Work out the value of x .

.....
(2 marks)

9 Work out

a $\sqrt{16 + 20}$

.....
(1 mark)

b $\frac{\sqrt[3]{125} + 10}{8 - 3}$

.....
(2 marks)

10 Mark says, '81 is a square number. Therefore, 810 is a square number.'

Is Mark correct? Explain your answer.

.....
.....
(1 mark)



Calculator

11 Billy is estimating the answer to this calculation:

$5949 - 2081$

He writes

5950 - 2080

a Explain why Billy's calculation is not a very good way to estimate the answer.

.....
.....
(1 mark)

b Write a better calculation to estimate the answer.

(1 mark)

12 Work out $\sqrt[3]{8}$

.....
(1 mark)

13 A farmer buys a tractor costing £19 975

He pays a deposit of £5890 and then 25 monthly payments.

Work out the farmer's monthly payments.

£.....
(3 marks)

14 Anthony says the answer to $(-10)^3$ is 1000

Anthony is not correct.

Explain why.

.....
.....
(1 mark)

15 8 square vegetable beds have a total area of 11.52 m^2 .

Work out the side length of each vegetable bed.

.....m

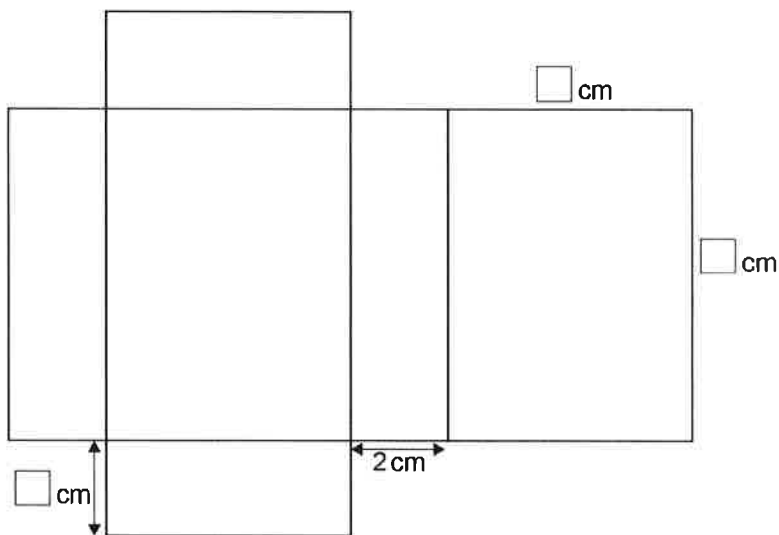
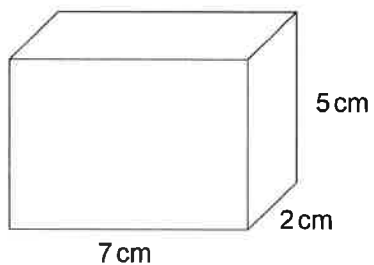
(3 marks)

Overall mark	/30
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NAME _____

Non-calculator

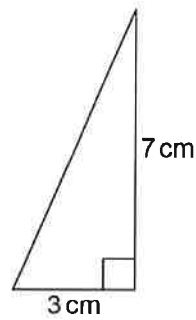
1 Here is a cuboid and its net.



Write in the missing lengths on the net.

(3 marks)

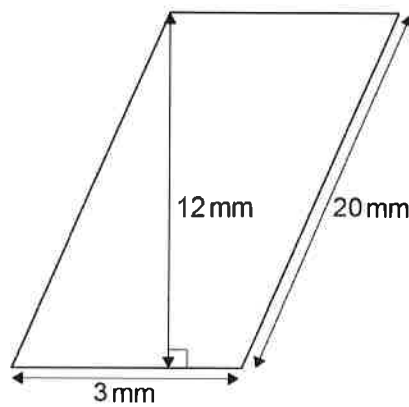
2 Work out the area of this triangle.



.....cm²

(2 marks)

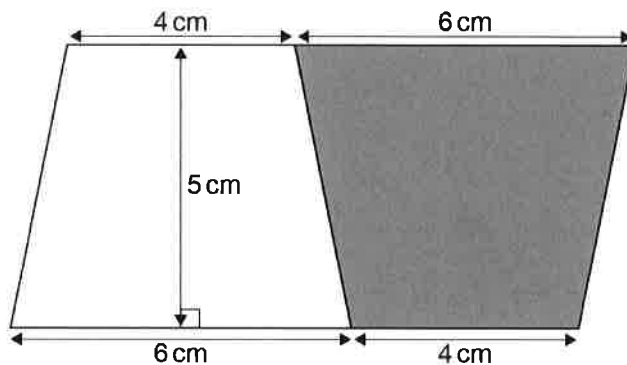
3 Work out the area of this parallelogram.



.....mm²

(2 marks)

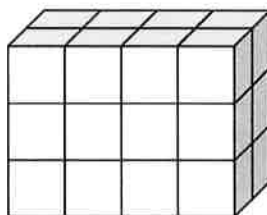
4 Work out the area of the shaded shape.



.....cm²

(2 marks)

5 A cuboid is made by joining together some centimetre cubes as shown below.

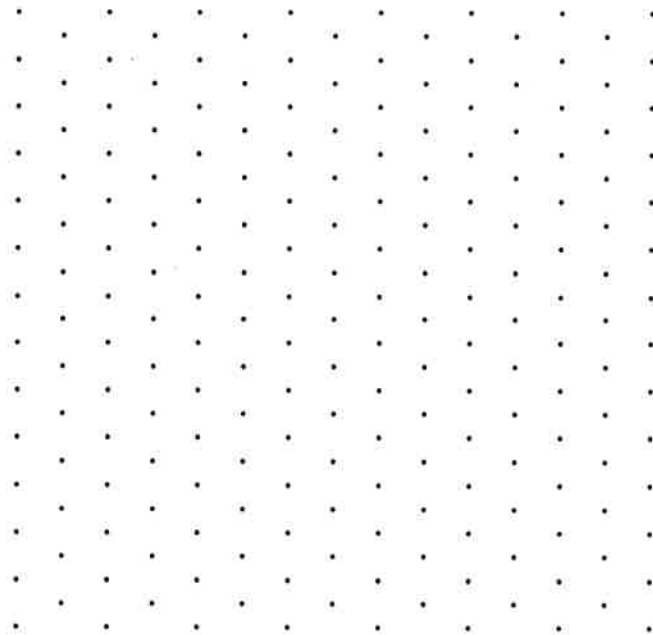


a Find the volume of this cuboid.

..... cm³

(1 mark)

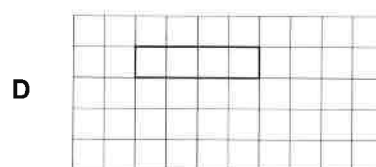
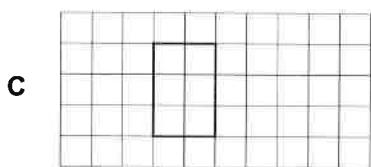
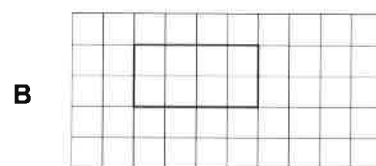
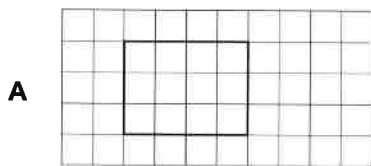
b Draw the cuboid on isometric paper.



(1 mark)

c One of the drawings below represents a **plan view** of the cuboid.

Circle the correct drawing.



(1 mark)

6 Write $<$, $>$ or $=$ for each pair of quantities.

a 1 km 30 m 1.3 km

(1 mark)

b 3.2 m 3200 mm

(1 mark)

7 Sketch a net for a square based pyramid.



(2 marks)

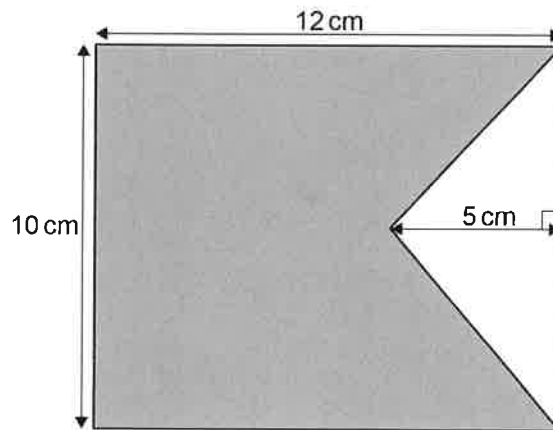
8 A cube has a side of length 4 cm.

Calculate the surface area of the cube.

.....cm²

(2 marks)

- 9 The diagram shows a piece of card in the shape of a rectangle with length 12 cm and width 10 cm. A triangle of perpendicular height 5 cm is cut from the card.



Enzo calculates the shaded area like this:

$$\begin{aligned}
 \text{shaded area} &= \text{area of rectangle} + \text{area of two triangles} \\
 &= 10 \times 7 + \frac{1}{2} \times 5 \times 5 + \frac{1}{2} \times 5 \times 5 \\
 &= 70 + 12.5 + 12.5 \\
 &= 95 \text{ cm}^2
 \end{aligned}$$

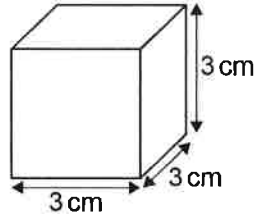
Show a different method to calculate the same shaded area.

(2 marks)



Calculator

10 Work out the volume of the cube.



.....

(2 marks)

11 1.75 pints \approx 1 litre.

Toby changes 3.4 pints into litres.

He writes: $3.4 \times 1.75 = 5.95$ litres

a Toby is incorrect. Explain why.

.....

(1 mark)

b Write down the correct solution.

..... litres

(1 mark)

12 1 kg \approx 2.2 lbs

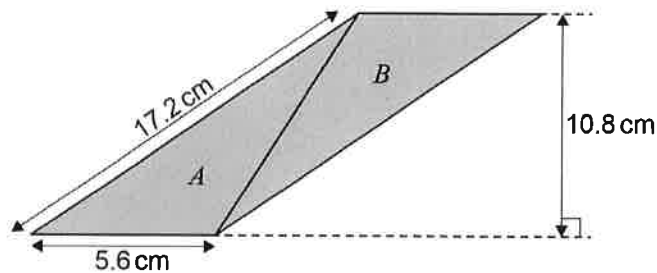
Simon weighs 165 lbs.

Estimate Simon's weight in kilograms.

.....kg

(1 mark)

13 The diagram shows triangles *A* and *B* joined together to make a parallelogram.



Calculate the area of triangle *A*.

.....cm²

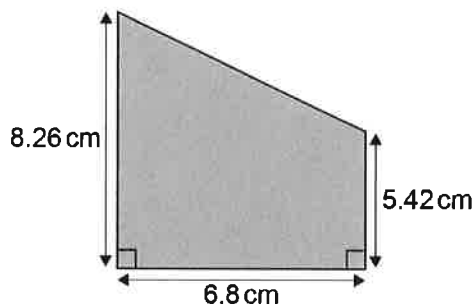
(2 marks)

14 Calculate the volume of a cube with side length 7 cm.

.....cm³

(1 mark)

15 Calculate the area of the trapezium.



.....cm²

(2 marks)

Overall mark	/30
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NAME

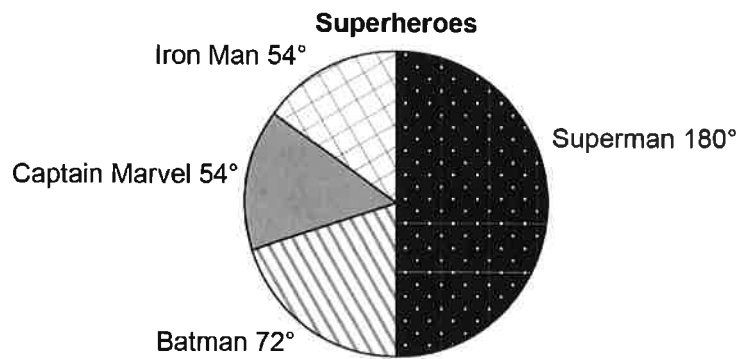
Non-calculator

1 Find the median of these numbers.

3 4 6 7 7 9 10 10 12 15

.....
(1 mark)

2 Students chose their favourite superheroes. The pie chart shows the results.



a What is the mode?

.....
(1 mark)

b What fraction of the students chose Superman?

.....
(1 mark)

c What percentage of the students chose Iron Man?

..... %
(1 mark)

3 At a sports event, Minesh records long jump distances.

He draws this table:

Distance, d (metres)	Tally	Frequency
$0 \leq d \leq 1$		
$1 \leq d \leq 2$		

Explain what is wrong with the groups in this table.

.....

.....

(1 mark)

4 Tariq measured the time students took to complete a times tables test.

The grouped frequency table shows the results.

Time, t (seconds)	Tally	Frequency
$5 \leq t < 10$		
$10 \leq t < 15$	 	
$15 \leq t < 20$	 	
$20 \leq t < 25$	 	
$25 \leq t < 30$	 	

a Tally these extra times into the table:

12 seconds 15 seconds

Complete the frequency column.

(1 mark)

b Write down the modal class.

.....

(1 mark)

- 5 The table shows the numbers of students winning gold, silver and bronze medals in different sports day events.

		Medals			Total
		Gold	Silver	Bronze	
Event type	Running			9	
	Throwing	5	7		21
	Total		13		40

- a How many students won a silver medal in a throwing event?

.....
(1 mark)

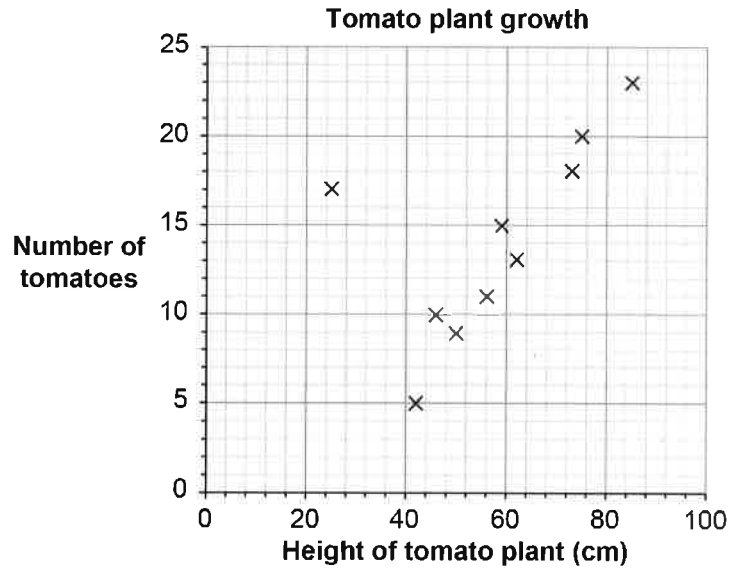
- b Complete the table.

(2 marks)

- c Work out the percentage of the 40 students winning a medal, who won a gold medal in a running event.

.....
(2 marks)

6 The scatter graph shows the heights of tomato plants and the numbers of tomatoes they produce.



The table shows data for two more tomato plants.

Height of tomato plant (cm)	Number of tomatoes
72	16
68	14

a Plot these on the scatter graph.

(1 mark)

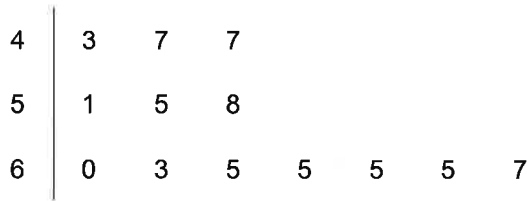
b Describe the correlation shown by the scatter graph.

.....

.....

(1 mark)

7 This stem and leaf diagram shows the ages of people at a tennis club on Tuesday.



Key: 4 | 3 means 43

a What is the modal age of the people at the tennis club on Tuesday?

.....
(1 mark)

This stem and leaf diagram shows the ages of people at the tennis club on Saturday.



Key: 1 | 6 means 16

b Which day had the higher median age? Explain how you know.

.....
.....
(1 mark)

c Which of the two days had the smaller range of ages?

Show your working clearly.

.....
(2 marks)



Calculator

8 The table shows the leg length of trousers a shop sells in one week.

Leg length (inches)	Number sold
28	7
29	5
30	11
31	10
32	13
33	4

a Which leg length is the mode?

..... inches

(1 mark)

b Work out the mean leg length.

..... inches

(3 marks)

9 Lily weighs 5 bags of apples from a farm shop.

Here are her results.

2.25 kg 2.4 kg 2.35 kg 2.5 kg 2.4 kg

Lily says, 'The 'average' weight is 2.38 kg.'

Which average has she used, the mean, median or the mode?

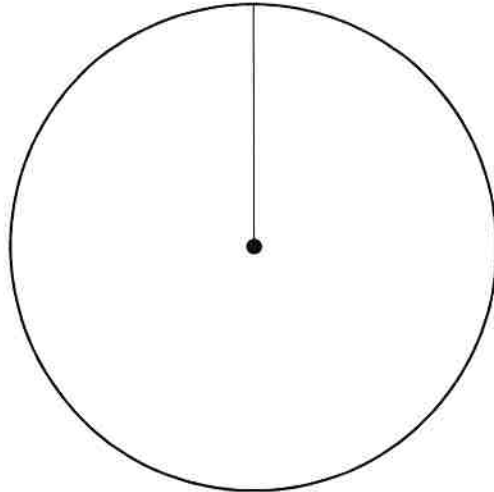
Show how you decided on your answer.

.....

(2 marks)

10 Draw a pie chart to show the data about the ages of people on a bus.

Age	Frequency
Under 16	12
16–59	8
60+	16
Total	



(3 marks)

11 The table shows the numbers of bicycles owned by different families in South Street.

Number of bicycles owned	Frequency
0	5
1	7
2	2
3	3
4	3

a Work out the range.

.....
(1 mark)

The mean number of bicycles owned by families in South Street is 1.6

The mean and range of the numbers of bicycles owned by families in North Street are

Mean	Range
2	3

b Using the ranges and means, compare the numbers of bicycles owned by families in South Street with those in North Street.

.....

.....

.....

.....

(2 marks)

Overall mark	/30
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NAME

Non-calculator

1 Simplify

a $b \times 7 \times a$

.....
(1 mark)

b $6x \times 3y$

.....
(1 mark)

c $y \times y \times y \times y \times y$

.....
(1 mark)

d $3x \times x$

.....
(1 mark)

e $-2x \times 5x$

.....
(1 mark)2 Expand $4(x - 6)$
(1 mark)

3 Mary had a baby daughter when she was 22 years old.

Write an expression for Mary's age in years when her daughter is x years old.

.....years

(1 mark)

4 Solve

a $x + 5 = 21$

.....

(1 mark)

b $3x = 15$

.....

(1 mark)

c $\frac{x}{4} = 3$

.....

(1 mark)

5 Solve

a $3x + 2 = 20$

.....

(1 mark)

b $8x - 5 = 35$

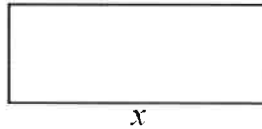
.....

(1 mark)

c $4(z + 7) = 36$

.....
(1 mark)

6 The length of this rectangle is x cm.



The width of the rectangle is 5 cm shorter than its length.

a Write an expression for the width of the rectangle.

..... cm
(1 mark)

b Write and simplify an expression for the perimeter of the rectangle.

..... cm
(2 marks)

c Explain why the value of x must be greater than 5

.....
.....
(1 mark)

7 Write an expression with brackets that expands to $14x - 35$

.....
(1 mark)

8 Factorise

a $18y + 8$

.....
(1 mark)

b $a^2 + 11a$

.....
(1 mark)



Calculator

9 A jug contains 750 ml of water.

Nav wants to fill glasses that hold x ml from the jug.

a If $x = 150$ ml, how many glasses that hold x ml can be filled from the jug?

.....
(1 mark)

b If $y = 160$ ml, how many glasses that hold y ml can be completely filled from the jug?

.....
(2 marks)

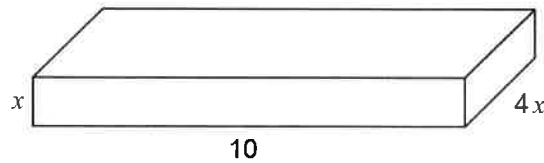
c Write an expression for the number of glasses that hold g ml that can be filled from the jug.

.....
(1 mark)

10 Work out the value of k^3 when $k = 6$

.....
(1 mark)

11 Here is a cuboid. All measurements are in cm.



Work out the volume of the cuboid when $x = 4.5$ cm

.....cm³
(2 marks)

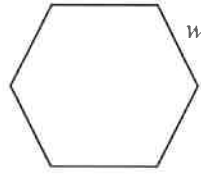
12 The formula for the total surface area A of a cube of side c is $A = 6c^2$

Calculate the total surface area of the cube when $c = 8.5$ cm

.....cm²
(1 mark)

13 A regular hexagon has sides of length w cm.

Its perimeter is 102 cm.



a Write an equation in terms of w for the perimeter of the hexagon.

.....
(1 mark)

b Solve your equation to find w

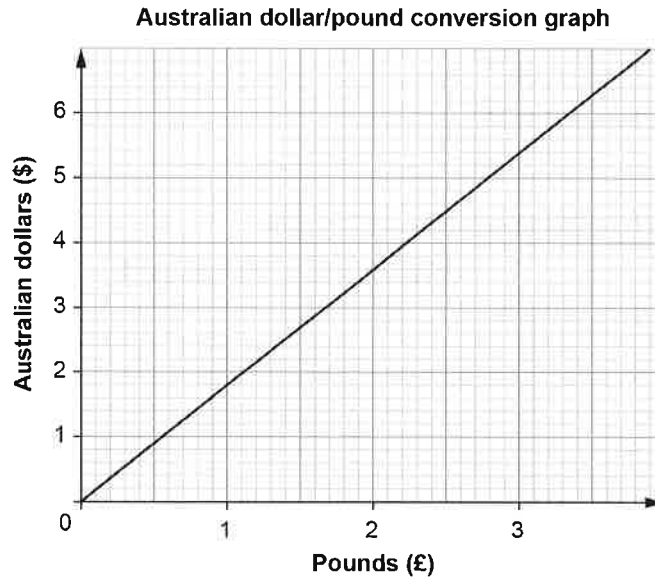
.....
(1 mark)

Overall mark	/30
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NAME

Non-calculator

1 This graph converts between Australian dollars (\$) and pounds (£).



a Use the graph to convert £2 to Australian dollars.

\$.....
(1 mark)

b Use the graph to convert 5 Australian dollars to pounds.

£.....
(1 mark)

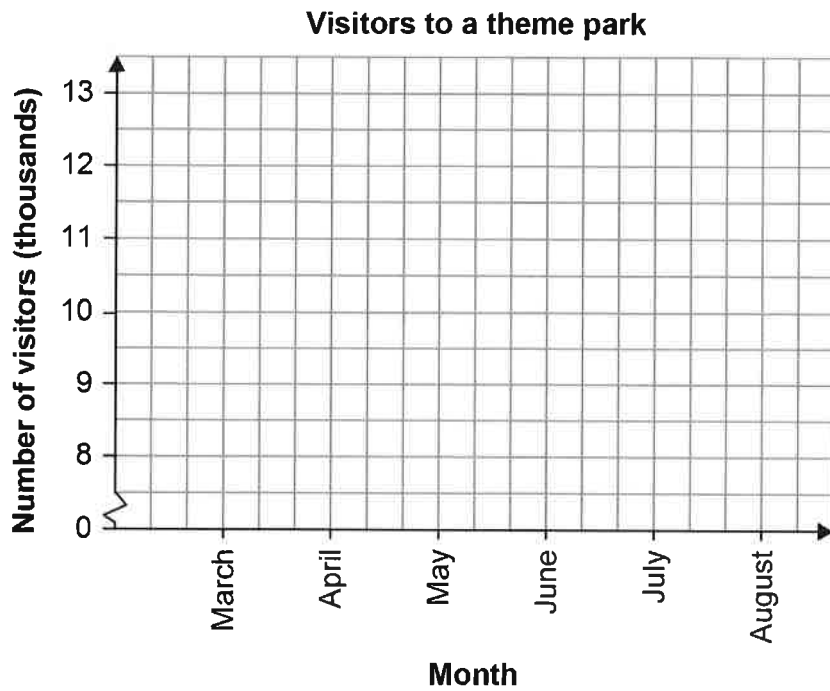
c Explain why the graph passes through the point (0, 0).

.....
.....
(1 mark)

2 The table shows the number of visitors to a theme park over a period of 6 months.

Month	Number of visitors (thousands)
March	9
April	11
May	10
June	10
July	13
August	12

Draw a line graph to show this information on this grid.



(2 marks)

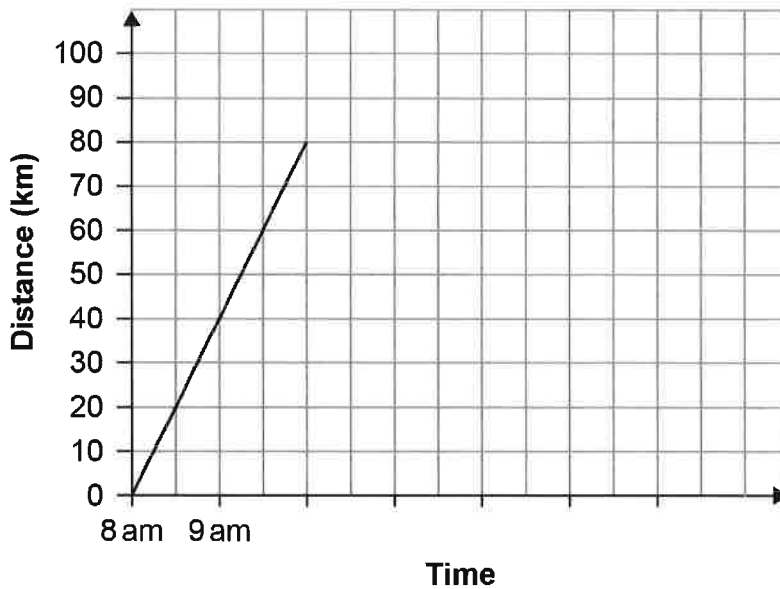
3 Emma leaves home at 8 am and drives 80 km to visit her friend. She arrives at 10 am.

Emma stays at her friend's house for 3 hours.

Then she drives home. It takes her 1 hour to drive home.

a Complete the distance–time graph to show her journey.

Emma's journey



(2 marks)

b What time did Emma arrive home?

.....
(1 mark)

c Did Emma drive at a faster speed to or from her friend's home?

Explain how you know.

.....
.....
.....

(1 mark)

4 Abdul leaves home at 10 am and walks 0.5 km to the bus stop.

He arrives at the bus stop at 10.15 am and waits 15 minutes for a bus.

The bus journey to the gym is 2.5 km.

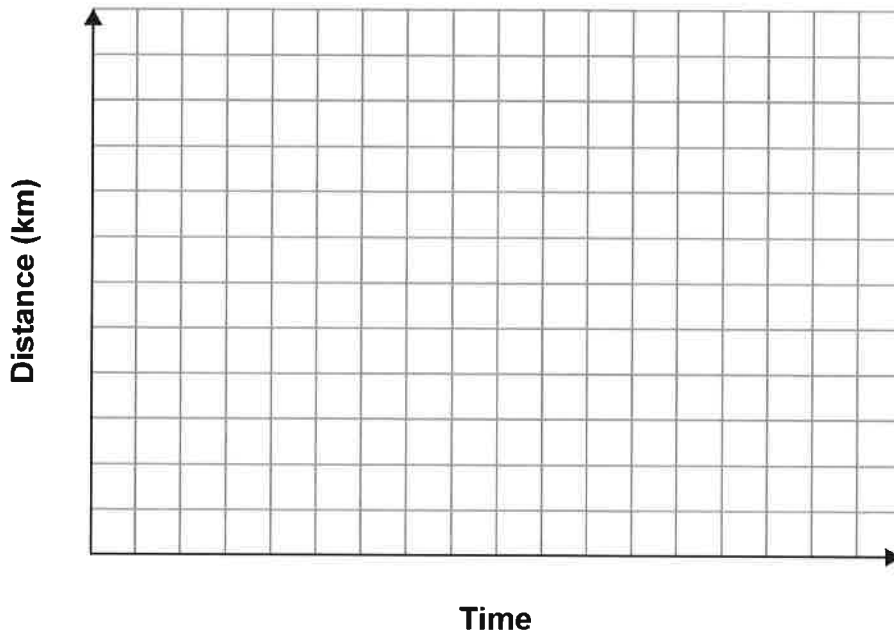
He arrives at the gym at 10.45 am.

He stays at the gym for $1\frac{1}{2}$ hours.

Then he jogs home, which takes $\frac{1}{2}$ hour.

a Draw a distance–time graph for Abdul's journey.

Abdul's journey



(3 marks)

b Abdul's mother had lunch ready at 1 pm.

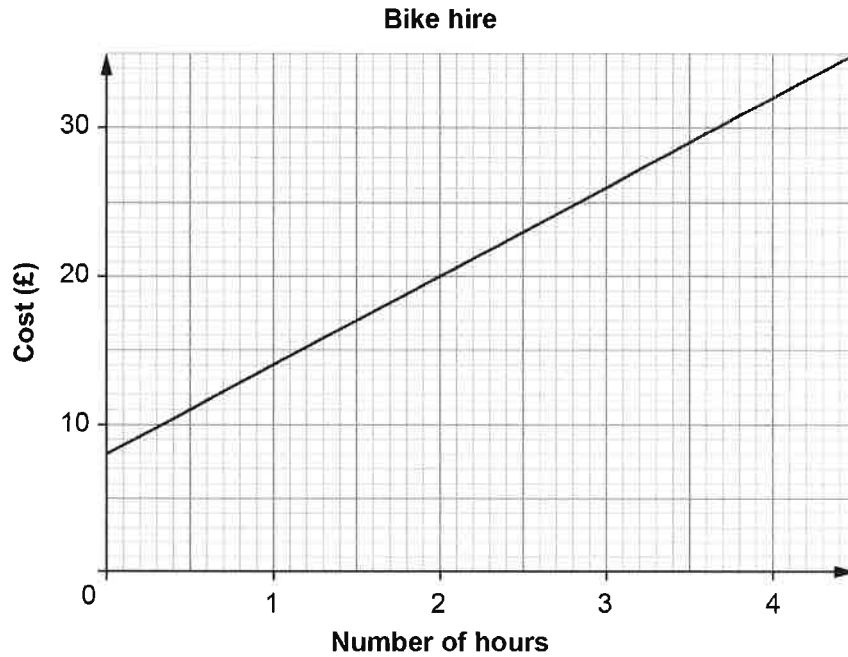
Was Abdul home in time for lunch? Explain.

.....

.....

(1 mark)

5 The graph shows the cost of hiring a bike.



Jade pays £29.

a How many hours does she hire the bike for?

..... hours
(1 mark)

The cost includes a basic fee and a cost per hour.

b How much is the basic fee?

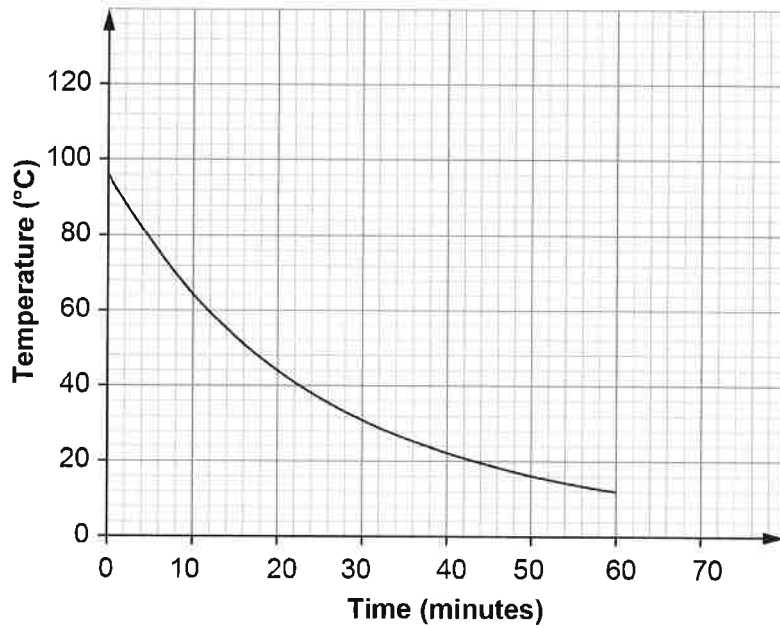
£.....
(1 mark)

c How much is the cost per hour?

£.....
(1 mark)

6 The graph shows how the temperature of a cup of tea changes over time.

Temperature of a cup of tea



a Was the tea getting hotter or colder? Explain how you know.

.....

.....

(1 mark)

b What was the starting temperature of the cup of tea?

.....°C

(1 mark)

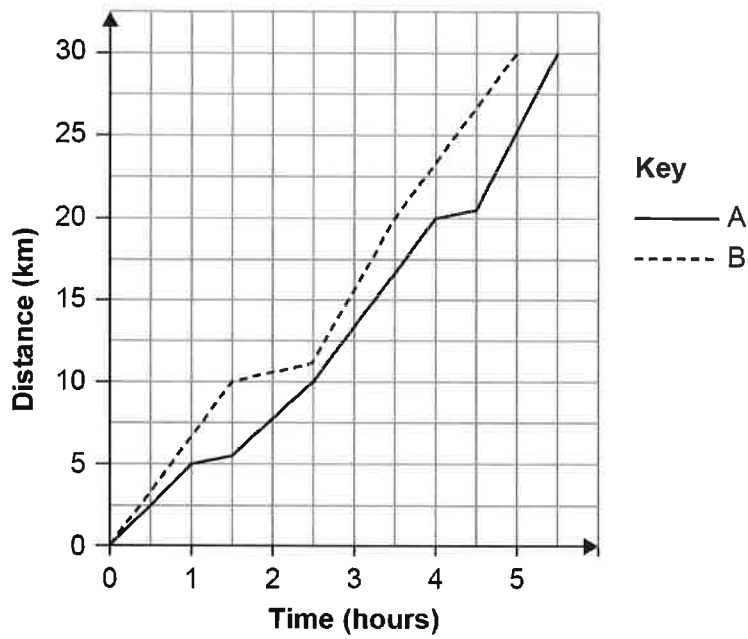
c How long did it take for the tea to cool to 40 °C?

.....minutes

(1 mark)

7 The graphs show the distances and times for two paddleboarders.

Paddleboarding race



Which paddleboarder won the race? Explain how you know.

.....

.....

.....

.....

(2 marks)



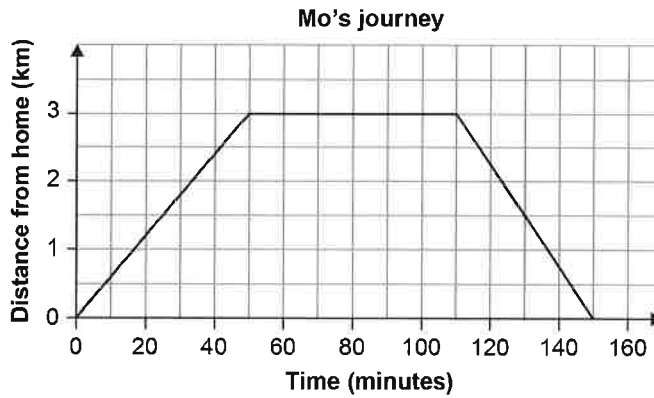
Calculator

8 Mo walks into town.

He spends some time at the shops.

Then he walks home.

The distance–time graph shows his journey.



a How long did it take Mo to walk into town?

.....minutes

(1 mark)

b How far did Mo walk in total, to town and back?

..... km

(1 mark)

c Explain what the horizontal line on the graph represents.

.....

(1 mark)

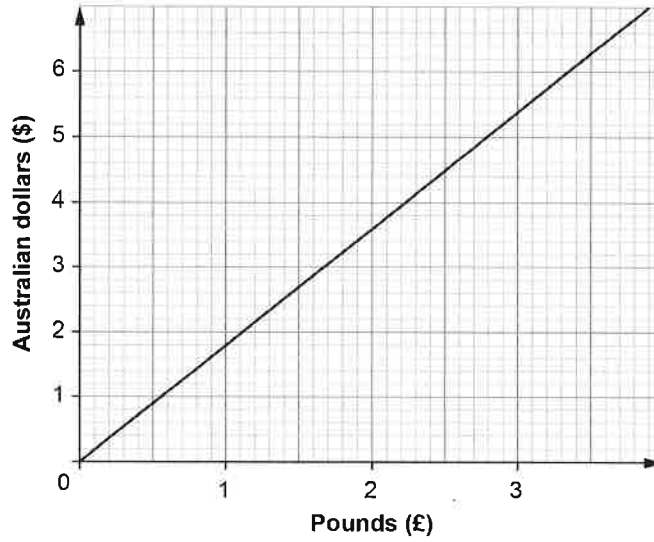
d How long did Mo stay in town?

.....minutes

(1 mark)

9 This graph converts between Australian dollars (\$) and pounds (£).

Australian dollar/pound conversion graph



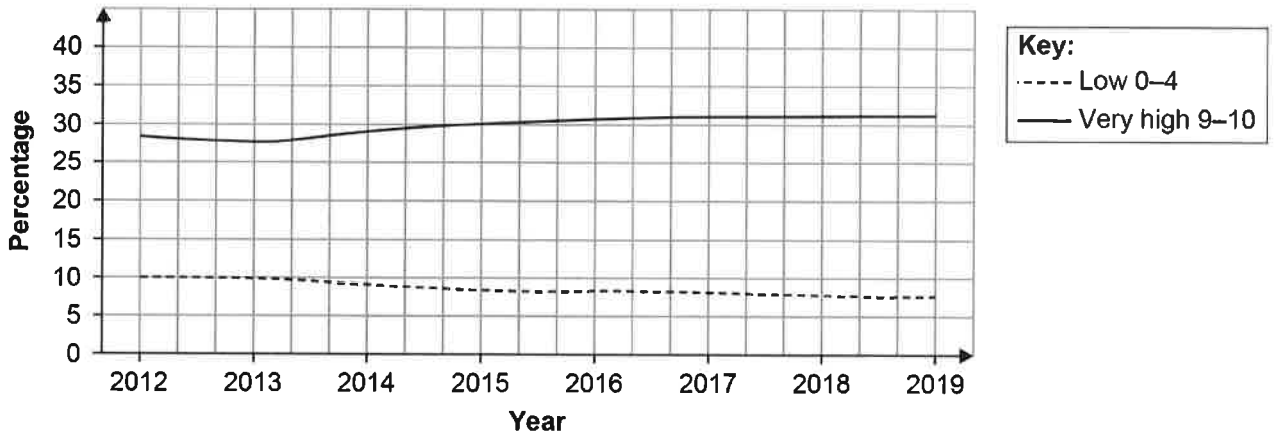
Convert £9 to Australian dollars.

\$

(2 marks)

10 People were asked to rate their happiness from 1 to 10. The graph shows the results.

Percentage of UK population reporting 'low' and 'very high' happiness rates, 2012–2019



a Estimate the percentage of people who reported low happiness rates in 2014.

.....%

(1 mark)

b Calculate an estimate for the difference in the percentage of people reporting high happiness rates between 2012 and 2019.

.....%

(2 marks)

Overall mark /30

NAME

Non-calculator

1 a Use an arrow (\downarrow) to point to 0.354 on the number line.



(1 mark)

b Which number on the number line does 0.354 round to (to 2 decimal places)?

.....
(1 mark)

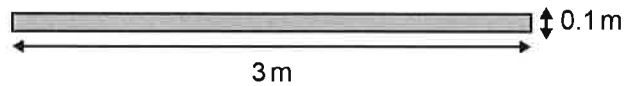
2 Which is the largest number.

12.6, 12.616 or 12.66?

Give a reason for your answer.

.....
.....
(1 mark)

3 Work out the area of this rectangle.



.....m²
(1 mark)

- 4 Here is a multiplication fact.

$$18 \times 7 = 126$$

Use this calculation to work out 1.8×7

.....
(1 mark)

- 5 a Round 0.007 419 to 1 significant figure.

.....
(1 mark)

- b Round 0.007 419 to 3 significant figures.

.....
(1 mark)

- 6 Write these decimals in descending order.

-7.4

-6.3

-0.74

-7.39

.....
(2 marks)

7 Mandy writes

$$506 \div 1 = 506$$

Therefore $506 \div 0.1 = 50.6$

Is Mandy correct?

Explain your answer.

.....

.....

(1 mark)

8 A farmer plants 124 rows of cabbages.

Each row has 38 cabbages.

Work out the total number of cabbages the farmer plants.

.....

(2 marks)

9 Work out $74.4 \div 0.6$

.....

(2 marks)

10 Angus works out 0.2×0.4

He says the answer is 0.8

Is Angus correct? Explain why.

.....

.....

(1 mark)

11 A piece of wood is 2.4 m long.

It is cut to make drumsticks.

Each drumstick is 0.4 m long.

How many drumsticks are made from the piece of wood?

.....

(2 marks)

12 The length of an armchair is 0.95 m.

A three-seater sofa is 2.2 times longer.

Work out the length of the three-seater sofa.

.....m

(2 marks)



Calculator

13 Oli, Sam and Tim share £360 in the ratio 3 : 2 : 1

Oli	Oli	Oli	Sam	Sam	Tim
-----	-----	-----	-----	-----	-----

How much is Sam's share?

£.....

(2 marks)

14 Sarah is working out $0.9 \div 0.03$

She says she will multiply both numbers by 10

Is this the best method? Explain why.

.....

(1 mark)

15 Write the ratio 4 : 18.8 as a ratio using only whole numbers.

Give your answer in its simplest form.

.....
 (2 marks)

16 5 cooks, 13 waiters and 4 other staff work at a restaurant.

a What is the ratio of cooks to waiters to other staff?

.....
 (1 mark)

The tips are shared equally between all the workers.

b One evening the tips total £338.10

How much do the waiters get in total? Give your answer to the nearest penny.

£.....
 (2 marks)

- c Another cook starts working at the restaurant.

What proportion of the tips do the cooks get now?

.....
(1 mark)

- 17 Share £28.08 in the ratio 7 : 5

£.....

£.....

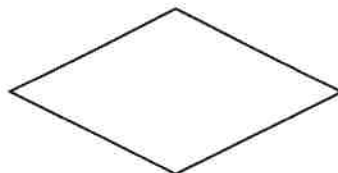
(2 marks)

Overall mark	/30
--------------	-----

NAME

Non-calculator

1 Here is a rhombus.



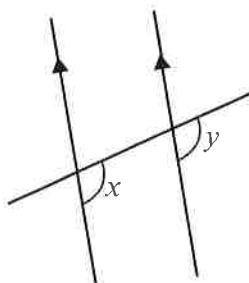
a Mark parallel lines with matching numbers of arrowheads, > or >>

(2 marks)

b Mark equal sides with matching numbers of dashes, | or ||

(1 mark)

2 What type of angles are x and y ?

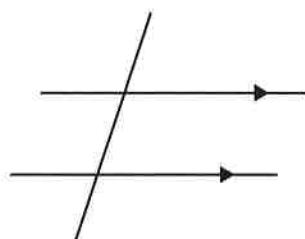


Choose from

alternate vertically opposite corresponding

.....
(1 mark)

3 Draw a pair of alternate angles on this diagram.



(1 mark)

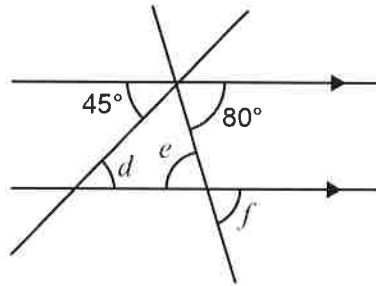
4 Name the quadrilateral that matches this description:

- two pairs of equal sides
- no parallel sides

.....
(1 mark)

5 Write the sizes of the angles marked with letters in this diagram.

Give a reason for each answer.



$d =$

Reason:

$e =$

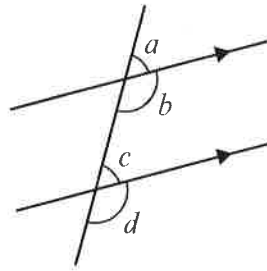
Reason:

$f =$

Reason:

(3 marks)

6 For this diagram



Maya says, 'a and d are corresponding angles, because they are both on the same side of the line.'

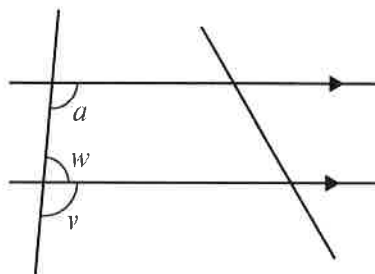
What mistake has Maya made?

.....

.....

(1 mark)

7 Here is a trapezium drawn between two parallel lines.



Complete these statements.

a angle $v =$ angle a because

.....

(1 mark)

b angle $w = 180 -$ angle v because

.....

(1 mark)

c angle $w = 180 -$ angle a so:
 angle $a +$ angle $w =$ angle $a + 180 -$ angle $a =$ $^{\circ}$

(1 mark)

d the two angles between the parallel lines, on the same side of a trapezium, add up to

(1 mark)

- 8 Sam says, 'The sum of the interior angles of any polygon is 360° '

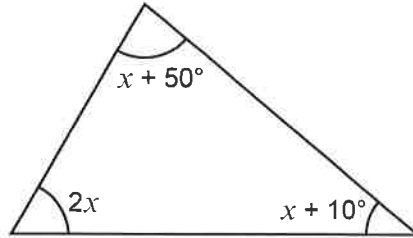
Explain why Sam is incorrect.

.....

.....

(1 mark)

- 9 Work out the size of the largest angle in this triangle.



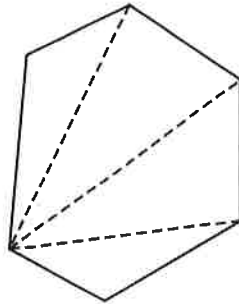
.....°

(3 marks)



Calculator

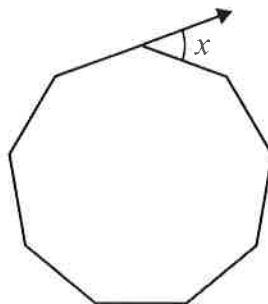
10 This irregular hexagon has been divided into triangles.



Work out the sum of the interior angles of the irregular hexagon.

.....
(2 marks)

11 Here is a regular nonagon.

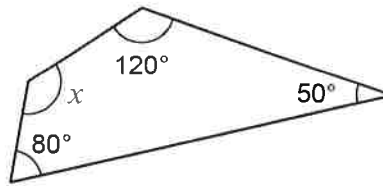


Each interior angle is 140°

Work out the size of the exterior angle x .

.....
(1 mark)

12 This quadrilateral has an unknown angle, x .



a Explain why $x = 360 - 120 - 50 - 80$

.....

(1 mark)

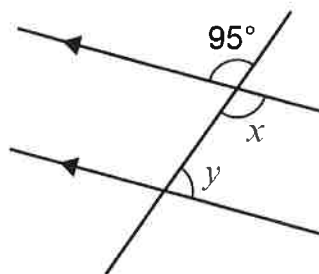
b Work out the value of x .

.....^o

(1 mark)

13 Write the sizes of the angles marked with letters in this diagram.

Give a reason for each of your answers.



$x =$ ^o

Reason:

.....

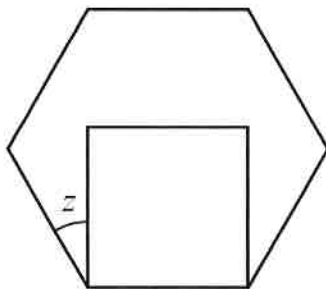
$y =$ ^o

Reason:

.....

(4 marks)

14 The diagram shows a square inside a regular hexagon.



Work out the size of angle z .

.....°

(3 marks)

Overall mark	/30
--------------	-----

NAME

Non-calculator

1 a Write each of these fractions with a denominator of 40.

$$\frac{1}{2} = \frac{\square}{40} \quad \frac{3}{4} = \frac{\square}{40} \quad \frac{3}{8} = \frac{\square}{40}$$

(1 mark)

b Write the fractions from part a in descending order of size.

.....

(1 mark)

2 Work out $\frac{1}{5} \times 3$

Give your answer as a fraction in its simplest form.

.....

(1 mark)

3 a Write $3\frac{2}{5}$ as an improper fraction.

.....

(1 mark)

b Work out

$$1\frac{5}{12} - \frac{5}{6}$$

.....
(2 marks)

4 Work out

$$8 \times \frac{6}{7}$$

Give your answer as a mixed number in its simplest form.

.....
(2 marks)

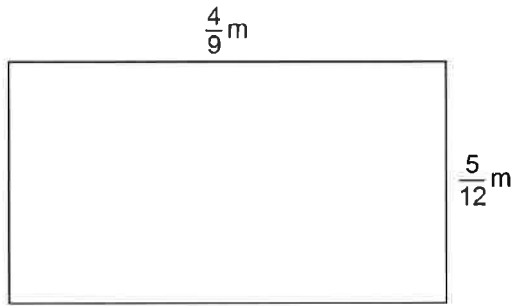
5 Work out

$$\frac{7}{12} + \frac{3}{4}$$

Give your answer as a mixed number in its simplest form.

.....
(2 marks)

6 Work out the area of this rectangle.



Give your answer as a fraction in its simplest form.

.....m²

(2 marks)

7 Anna works out $\frac{1}{9} + \frac{5}{18}$

She writes the answer $\frac{6}{27}$

Explain what Anna has done wrong.

.....

.....

(1 mark)

8 Crista makes 10 pizzas for a party.

She assumes each of her friends will eat $\frac{2}{5}$ of a pizza.

If Crista's assumption is correct, how many people will her 10 pizzas feed?

.....

(2 marks)

- 9 Antony says that $3\frac{5}{6} - 2\frac{1}{2}$ gives the same answer as $7 \div 5\frac{1}{4}$

Show that Antony is correct.

(5 marks)



Calculator

- 10 Eva says that $\frac{3}{8}$ is smaller than $\frac{1}{2}$

Explain how she knows.

.....

.....

(1 mark)

- 11 Complete the calculation.

$$\frac{11}{20} - \frac{1}{2} = \frac{11}{20} - \frac{\square}{20}$$

$$= \frac{\square}{20}$$

(1 mark)

12 Kamal works out $\frac{7}{10} \times \frac{3}{10}$

He writes:

$$\frac{7}{10} \times \frac{3}{10} = \frac{21}{10} = 2 \frac{1}{10}$$

What mistake has Kamal made?

.....

.....

(1 mark)

13 a Write down the reciprocal of $\frac{1}{8}$

.....

(1 mark)

b Complete the calculation.

$$\begin{aligned} \frac{3}{4} \div \frac{1}{8} &= \frac{3}{4} \times \square \\ &= \frac{\square}{\square} \\ &= \square \end{aligned}$$

(2 marks)

14 Write these fractions in ascending order of size.

$$\frac{3}{5} \quad \frac{5}{12} \quad \frac{1}{2} \quad \frac{2}{3}$$

.....

(2 marks)

15 Complete the fraction with 9 as the numerator to make a correct statement.

$$\frac{9}{\dots} \leq \frac{1}{2}$$

.....
(1 mark)

16 The reciprocal of a fraction is $1\frac{1}{2}$

What is the fraction?

.....
(1 mark)

Overall mark	/30
--------------	-----

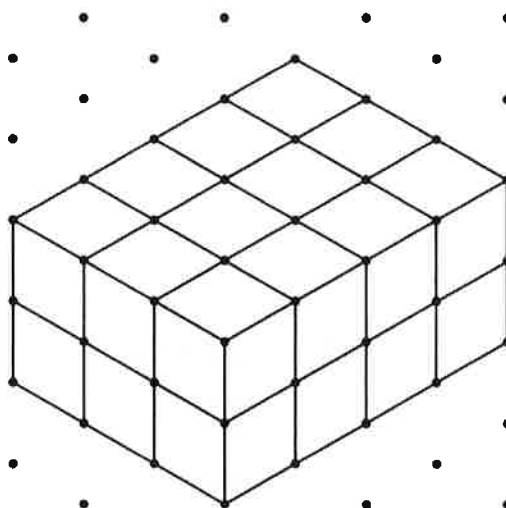
NAME

Non-calculator

1 Simplify $x \times 5 \times y$

.....
(1 mark)

2 This cuboid is made from 1 cm cubes.



Kai has twenty 1 cm cubes.

Explain why he does not have enough to make this cuboid.

.....

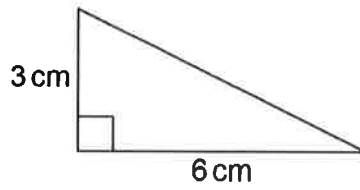
.....

.....

.....

(2 marks)

3 Work out the area of this triangle.

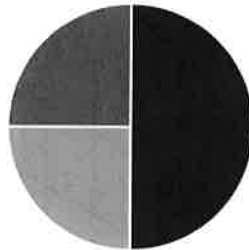


.....cm²

(2 marks)

4 The pie chart shows the instruments in a school orchestra.

School orchestra instruments



Key: ■ String ■ Brass ■ Woodwind

a What fraction of the instruments are brass?

.....

(1 mark)

b There are 48 instruments in the orchestra.

How many are string instruments?

.....

(1 mark)

5 Work out $77.5 \div 25$

.....
(1 mark)

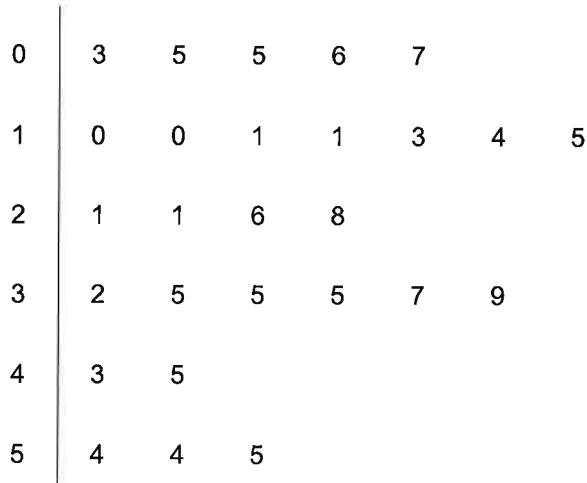
6 Round each number in this calculation to the nearest 1000

Then work out an estimate for the answer.

$$15\,806 + 7129 - 11\,008$$

.....
(2 marks)

7 The stem and leaf diagram shows the ages of people visiting a library on Friday.



Key: 2 | 1 means 21

Two more people visited the library on Friday. Their ages were 9 and 17

a Write these two ages in the stem and leaf diagram.

(1 mark)

b How many people visited the library on Friday?

.....
(1 mark)

c Work out the range of the ages of people visiting the library on Friday.

.....
(1 mark)

d Find the median age of people visiting the library on Friday.

.....
(2 marks)

8 Simplify

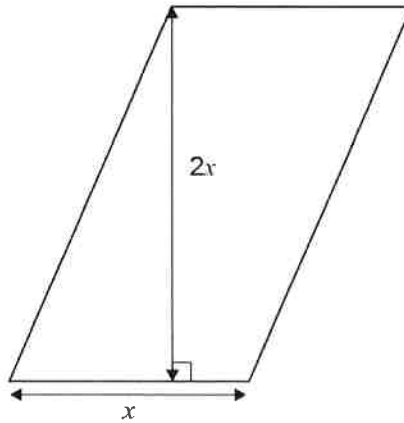
a $3x \times 4x$

.....
(1 mark)

b $c \times 6c$

.....
(1 mark)

9 a Write an expression for the area of this parallelogram.



.....
(1 mark)

b Use your expression to find the area of the parallelogram when $x = 4$ cm

.....cm²
(1 mark)

10 Find the missing terms so that the following is correct:

$$7(x + \square) = \square + 21$$

..... and

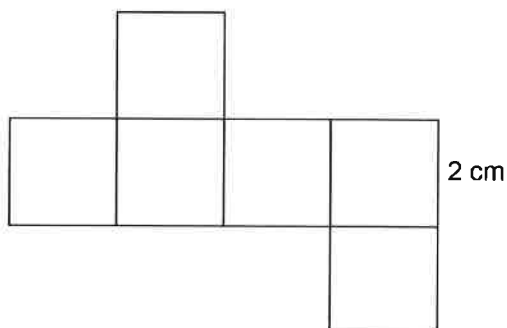
(2 marks)



Calculator

11 The diagram shows the net of a cube.

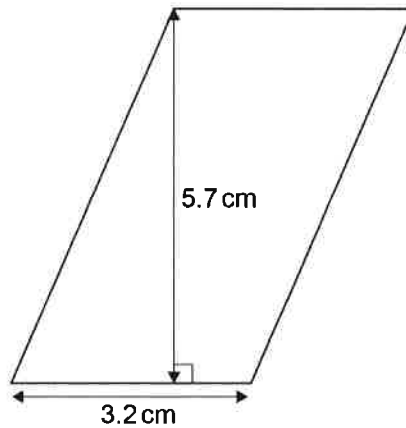
Work out the total surface area of the cube.



.....cm²

(2 marks)

12 Work out the area of this parallelogram.



..... cm²
(2 marks)

13 Work out $\sqrt{75}$

Give your answer to 1 decimal place.

.....
(1 mark)

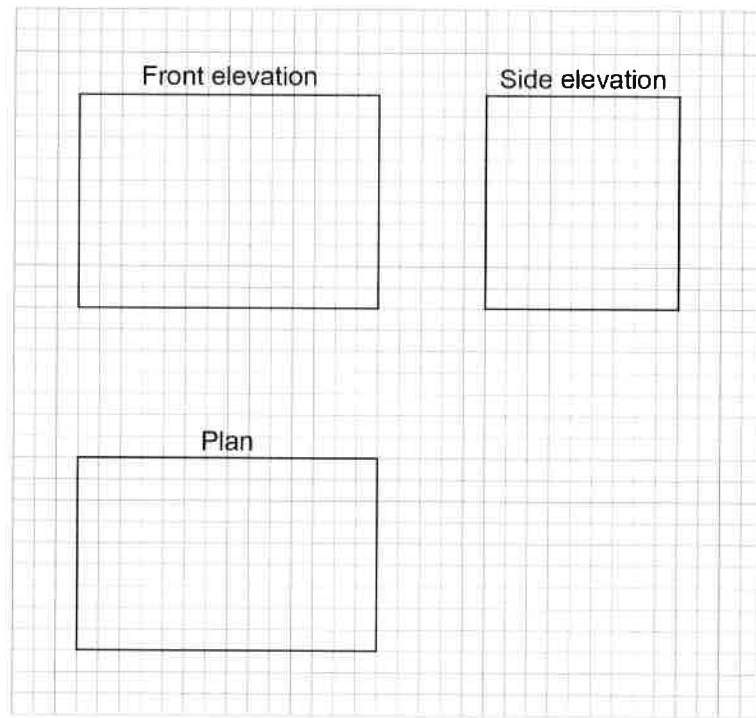
14 Work out the volume of a cube with side length 3.8 mm.

Give your answer to 1 decimal place.

..... mm³
(2 marks)

15 The diagram shows the plan and elevations of a fish tank,

The diagrams are drawn on a 1 cm squared grid.



a Work out the volume of the fish tank.

.....cm³

(2 marks)

All five faces of the fish tank are made from glass.

b Calculate the area of glass used to make the fish tank.

.....cm²

(3 marks)

16 a Write 45 as a product of its prime factors.

.....
(2 marks)

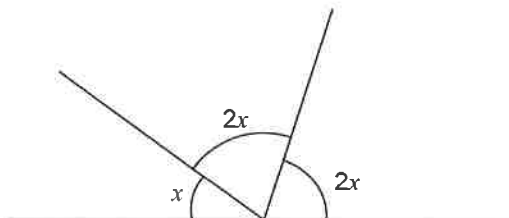
b Write 120 as a product of its prime factors, using index notation.

.....
(2 marks)

c Use your answers to parts a and b to find the LCM (lowest common multiple) of 45 and 120

.....
(1 mark)

17 Write down and solve an equation to work out the value of x



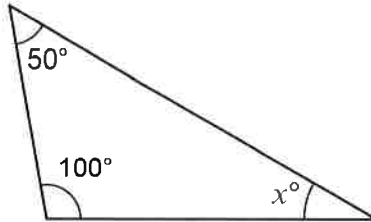
.....
(2 marks)

Overall mark	/40
--------------	-----

NAME

Non-calculator

1 This triangle has an unknown angle, x .



a Explain why $x = 180 - 50 - 100$

.....

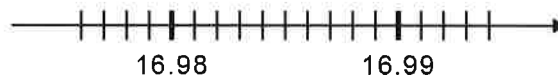
(1 mark)

b Work out the value of x .

$x =$

(1 mark)

2 a On the scale, draw an arrow (\downarrow) to point to the number 16.982



(1 mark)

b Write 16.982 to 2 decimal places.

.....

(1 mark)

3 Work out

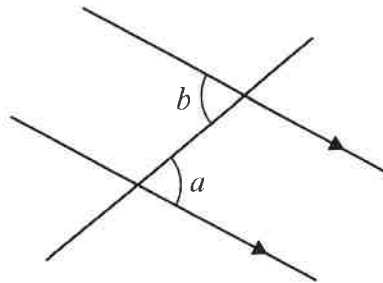
a $1 \div 0.1$

.....
(1 mark)

b $6 \div 0.1$

.....
(1 mark)

4 The diagram shows two angles, a and b .



Lucy says, ' a and b are alternate angles.'

Jay says, ' a and b are corresponding angles.'

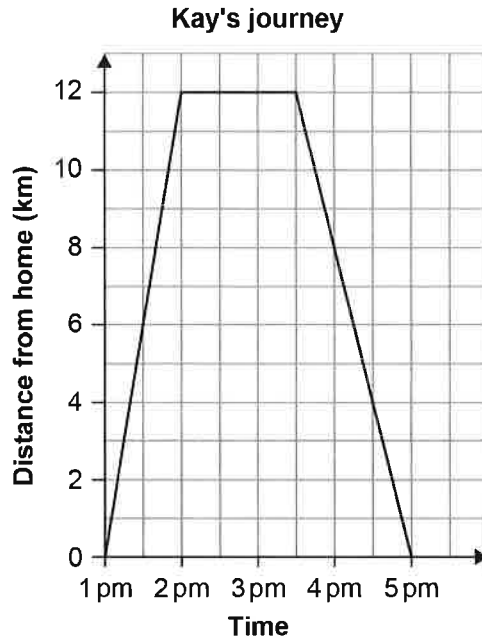
Who is correct? Explain how you know.

.....
.....
(1 mark)

5 Kay cycles to the swimming pool.

She stays there for a while and then cycles home.

The distance–time graph shows her journey.



a How far is the swimming pool from Kay's house?

.....
(1 mark)

b What time did Kay arrive at the swimming pool?

.....
(1 mark)

c How long did Kay stay at the swimming pool?

.....
(1 mark)

d When did Kay cycle faster: on her way to the pool or on the way home?

Explain how you know.

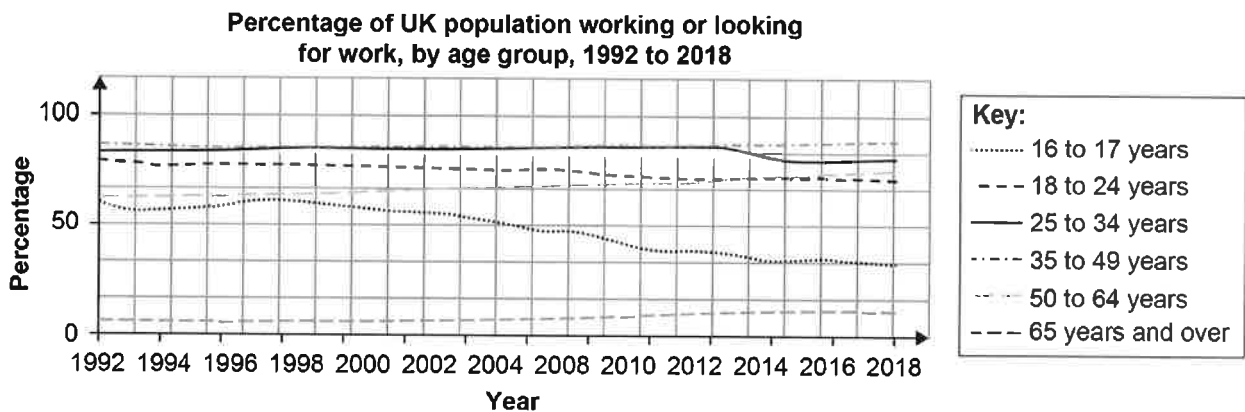
.....
.....
(1 mark)

6 Write this list of decimal numbers in descending order.

-3.5, -3.15, -4, -3.145

(2 marks)

7 The graph shows the percentage of the population working or looking for work, for different age groups in the UK.



a Which age group shows the greatest decrease in the percentage of people working or looking for work from 1992 to 2018?

(1 mark)

b Which two age groups show a slight increase in the percentage of people working or looking for work from 1992 to 2018?

and

(2 marks)

8 The west stand of a stadium has 108 rows.

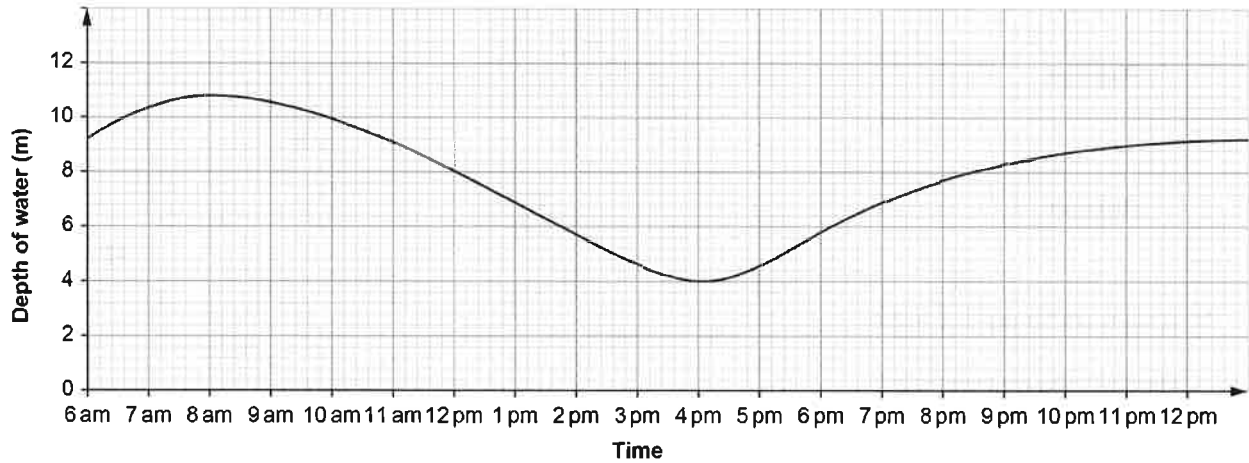
Each row has 216 seats.

How many seats are in the west stand?

.....
(2 marks)

9 The graph shows the depth of water in a harbour over an 18-hour period.

Depth of water in a harbour



a What was the minimum depth of water in the harbour?

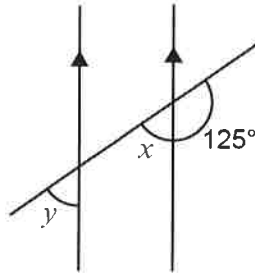
.....
(1 mark)

b At what time did this minimum depth occur?

.....
(1 mark)

10 Work out the size of each angle labelled with a letter.

Give reasons.



$x = \dots\dots\dots^\circ$

Reason:

$y = \dots\dots\dots^\circ$

Reason:

(2 marks)

11 Angus works out 0.2×0.4

He says the answer is 0.8

Is Angus correct? Explain your answer.

.....

(1 mark)

12 A tree trunk is 3.2 m long.

It is split into logs. Each log is 0.4 m long.

How many logs are made from the tree trunk?

.....

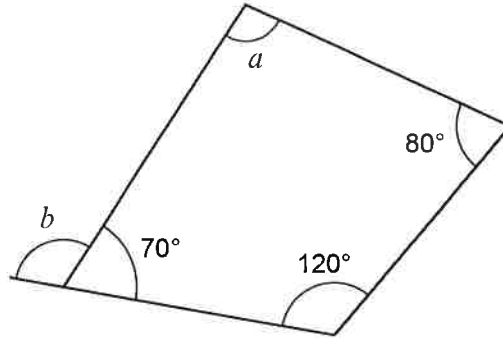
(2 marks)



Calculator

13 Work out the size of each angle labelled with a letter.

Give reasons.



$a = \dots\dots\dots^\circ$

Reason:

$b = \dots\dots\dots^\circ$

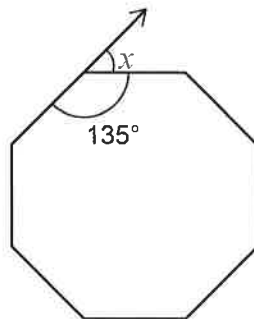
Reason:

(2 marks)

14 Here is a regular octagon.

Each interior angle is 135° .

Work out the size of the exterior angle x .



$x = \dots\dots\dots^\circ$

(2 marks)

15 Ali, Tom and Dan share £420 in the ratio 1 : 2 : 4

a Complete the bar to show Tom's and Dan's shares.

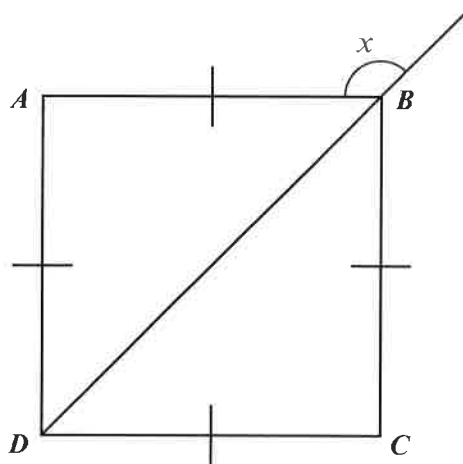
Ali	Tom					
-----	-----	--	--	--	--	--

(1 mark)

b Work out the value of Dan's share.

.....
(2 marks)

16 $ABCD$ is a square.



Work out the size of angle x .

$x = \text{.....}^\circ$

(2 marks)

17 Write this ratio as a whole number ratio in its simplest form.

12 : 16.8

.....
 (2 marks)

18 Belle says, 'The sum of the interior angles of a hexagon is $6 \times 180^\circ = 1080^\circ$.'

a What mistake has she made?

.....

 (1 mark)

b What is the correct sum of the interior angles of a hexagon?

.....°
 (1 mark)

19 Share £17.28 in the ratio 5 : 4

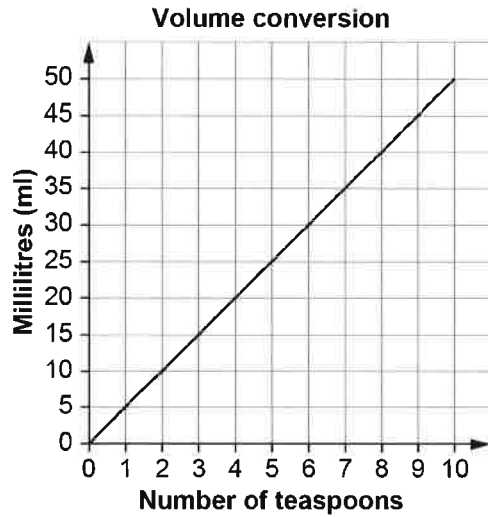
.....
 (2 marks)

Overall mark	/40
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NAME

Non-calculator

1 This graph converts between the amount of liquid in a teaspoon and millilitres (ml).



a Use the graph to find

i the number of teaspoons needed to hold 10 ml

..... teaspoons
(1 mark)

ii the amount, in ml, that 5 teaspoons can hold.

.....ml
(1 mark)

b Jenny says that when the number of teaspoons doubles, the amount of liquid they can hold doubles.

Is Jenny correct?

Use the graph to explain why.

.....
.....

(1 mark)

- 2 a Write $1\frac{3}{8}$ as an improper fraction.

.....
(1 mark)

- b Work out

$$4\frac{3}{10} + 1\frac{2}{5}$$

.....
(1 mark)

- c Work out

$$1\frac{3}{8} - \frac{3}{4}$$

.....
(1 mark)

3 a Convert 0.5 kg to grams.

.....g
(1 mark)

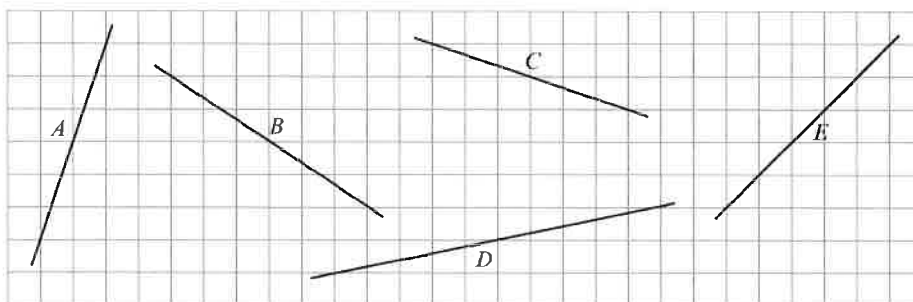
b Write 200 g as a fraction of 0.5 kg.
Give your answer in its simplest form.

.....
(2 marks)

c Write 200 g as a percentage of 0.5 kg.

.....%
(1 mark)

4 The diagram shows line segments *A* to *E*.



a Write the letters of the line segments that have a positive gradient.

.....
(1 mark)

b Write down the letter of the line segment that has the greatest positive gradient.

.....
(1 mark)

5 Write these fractions in descending order of size.

$$\frac{1}{2} \quad \frac{4}{7} \quad \frac{5}{9}$$

.....
(1 mark)

6 a Write $\frac{1}{8}$ as a decimal.

.....
(1 mark)

b Is your answer to part a a recurring decimal or a terminating decimal? Explain.

.....
.....
(1 mark)

7 A survey asked 40 households:

'Do you grow any fruit or vegetables in your garden?'

13 households answered 'Yes'.

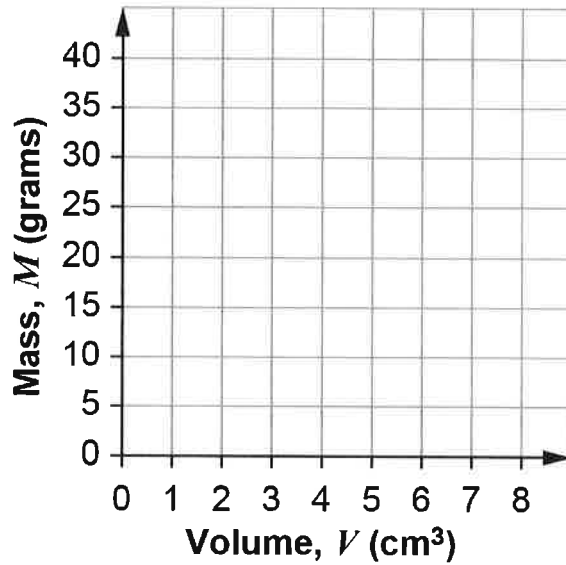
Work out the percentage of these households that answered 'Yes'.

..... %
(2 marks)

8 The table shows the masses of different volumes of the chemical element radium.

Mass, M (grams)	10	15	40
Volume, V (cm ³)	2	3	8

a Draw a graph of mass (M) against volume (V) for radium.



(1 mark)

b Write an equation linking mass (M) and volume (V).

.....
(2 marks)

c Are mass (M) and volume (V) in direct proportion? Explain.

.....

(2 marks)

9 Abe works out

$$\frac{3}{7} + \frac{3}{14}$$

He writes the answer $\frac{6}{21}$

Explain what Abe has done wrong.

.....

.....

(1 mark)

10 A jar holds $\frac{2}{3}$ of a cup of liquid.

How many jars can be filled from 18 cups of liquid?

.....

(2 marks)



Calculator

11 a Write each of these fractions with a denominator of 20.

$$\frac{1}{2} = \frac{\square}{20} \quad \frac{7}{10} = \frac{\square}{20} \quad \frac{3}{5} = \frac{\square}{20}$$

(1 mark)

b Write the fractions in part a in ascending order of size.

.....

(1 mark)

12 There are 10 people at a bus stop.

7 are adults. The rest are children.

Write the proportion that are children as

a a fraction

.....
(1 mark)

b a percentage

..... %
(1 mark)

13 Sally says that $\frac{7}{12}$ is larger than $\frac{1}{2}$

Explain how she knows.

.....
.....
(1 mark)

14 Complete the calculation.

$$\frac{9}{16} - \frac{1}{2} = \frac{9}{16} - \frac{\square}{16}$$

$$= \frac{\square}{16}$$

(1 mark)

15 Write $\frac{5}{12}$ as a recurring decimal using dot notation.

.....
(1 mark)

16 Salim buys pet insurance for his cat.

Last year it cost £137.75

This year the cost increases by 12%.

What is the cost of pet insurance this year?

£.....
(2 marks)

17 On a 3.5 km road, there are 700 m of roadworks.

What percentage of the road has roadworks?

..... %
(2 marks)

18 These are the labels from two different bars of chocolate.

Chocolate bars	
250g bar	
Carbohydrate	60g
Fat	172.5g
Protein	17.5g

Chocolate bars	
200g bar	
Carbohydrate	40g
Fat	152g
Protein	8g

Which bar of chocolate contains the greater proportion of fat?

Show working to support your answer.

.....
(4 marks)

Overall mark	/40
--------------	-----

