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Wednesday 11 January 2012 – Morning

GCSE MATHEMATICS SYLLABUS A

J512/01 Paper 1 (Foundation Tier)

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)

Duration: 2 hours

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- 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 **100**.
- This document consists of **24** pages. Any blank pages are indicated.

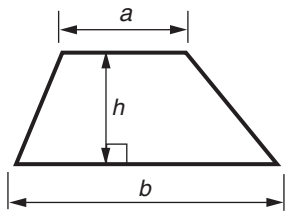
WARNING

No calculator can be used for this paper

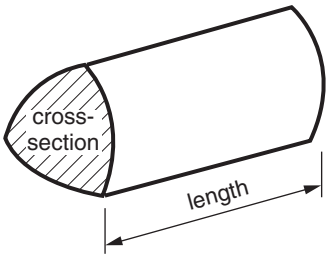
This paper has been pre modified for carrier language

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) × length



PLEASE DO NOT WRITE ON THIS PAGE

1

25	3	105	23
62	7		
4	40	57	10

From the numbers in the box, write down

(a) the smallest odd number,

(a) _____ **[1]**

(b) an even number bigger than 50,

(b) _____ **[1]**

(c) a factor of 35,

(c) _____ **[1]**

(d) a multiple of 20,

(d) _____ **[1]**

(e) two numbers with a total of 80,

.....

.....

(e) _____ **[1]**

(f) two numbers that multiply together to give 100.

.....

.....

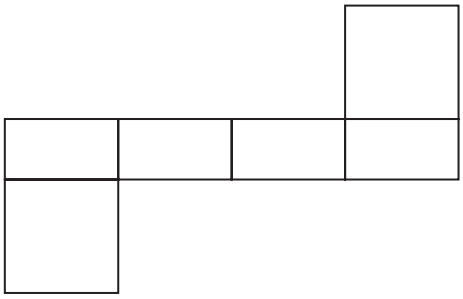
(f) _____ **[1]**

2 (a)

Square-based pyramid	Cuboid	
Cylinder		Sphere
Cone	Cube	
Triangular prism		Hexagonal prism

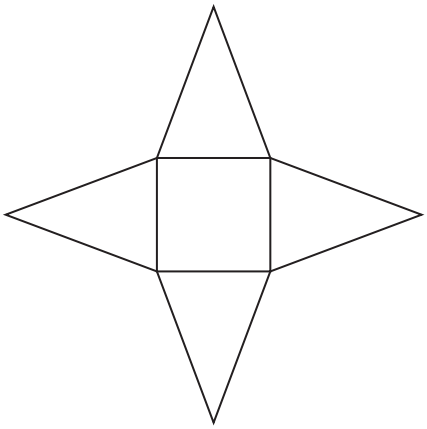
Write the mathematical name of the 3-D shapes that have these nets.
Choose from the list in the box.

(i)



(a)(i) _____ **[1]**

(ii)

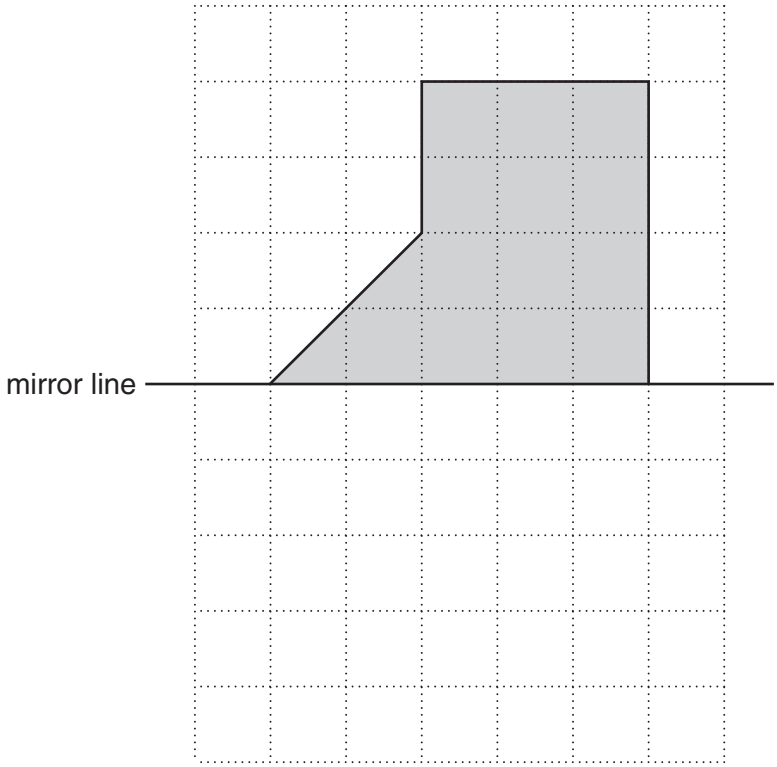


(ii) _____ **[1]**

(iii)

(iii) _____ **[1]**

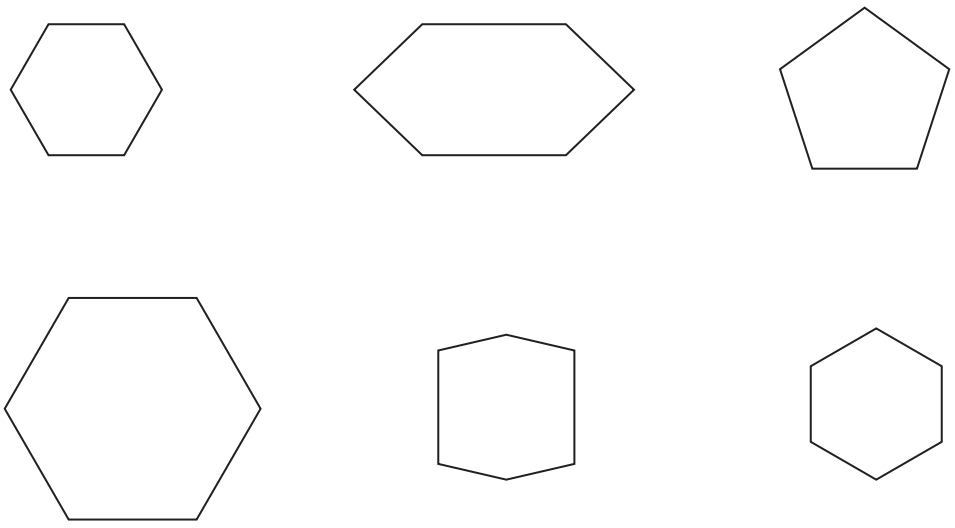
(b) Draw the reflection of this shape in the mirror line.



[2]

(c) Look at the shapes below.

Put a tick (✓) in each of the **two** shapes that are **congruent**.



[1]

3 Chose from these five events to complete the sentences below.
Write the appropriate letter in the space.

A	It will snow during the winter.
B	My dog will pass GCSE maths.
C	It will rain every day next week.
D	An ordinary dice will show a 1, 2, 3, 4, 5 or 6.
E	An ordinary dice will show an even number.

(a) Event _____ is impossible. **[1]**

(b) Event _____ is likely to happen. **[1]**

(c) Event _____is certain to happen. **[1]**

(d) Event _____ has a fifty-fifty chance of happening. **[1]**

4 **(a)** Write as a decimal.

(i) $\frac{1}{4}$

(a)(i) _____ **[1]**

(ii) 30%

(ii) _____ **[1]**

(b) Write these numbers in order of size, starting with the smallest.

$\frac{1}{4}$ 30% 0.2

.....

.....

(b) _____ _____ _____ **[1]**
smallest

5 **(a)** **(i)** Write down the two missing numbers in this sequence.

5 _____ 19 26 33 _____ **[2]**

(ii) Write down the rule for your sequence.

_____

_____ **[1]**

(b) A different sequence is made using this rule.

The first term of the sequence is 9.

(i) Write down the second term of the sequence.

.....

.....

(b)(i) _____ **[1]**

(ii) Write down the 50th term of the sequence.

.....

.....

(ii) _____ **[1]**

6 **(a)** What is the value of the 7 in the number 17 238?

(a) _____ **[1]**

(b) What is the value of the 3 in the number 17.34?

(b) _____ **[1]**

(c) What is the value of the 2 in the **answer** to 32 × 100?

.....

.....

(c) _____ **[1]**

(d) What is the value of the 9 in the **answer** to 7913 ÷ 100?

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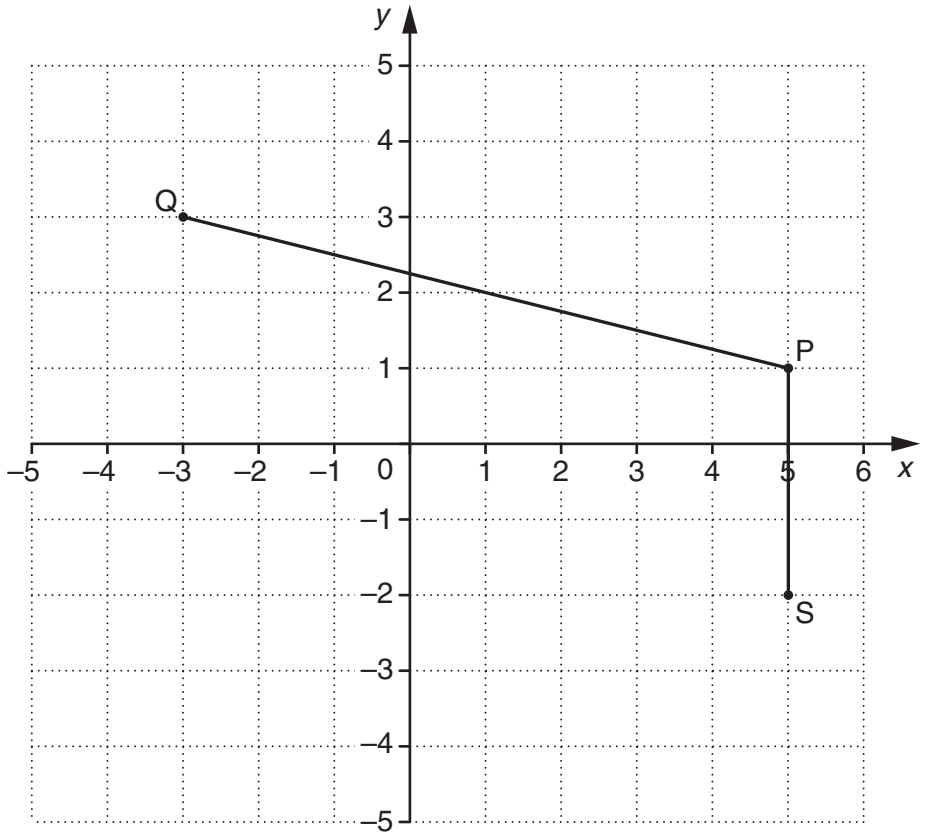
(d) _____ **[1]**

7



(a) Write down the coordinates of point P.

(a) (_____ , _____) **[1]**

(b) Write down the coordinates of point Q.

(b) (_____ , _____) **[1]**

(c) Write down the coordinates of the midpoint of the line PQ.

(c) (_____ , _____) **[1]**

Lizzie marks point R on the grid so that the shape PQRS is a parallelogram.

(d) Write down the coordinates of point R.

(d) (_____ , _____) **[1]**

8 Marcus wants to buy two rabbits.
A pet shop has **four** breeds of rabbit for sale:

Dwarf Lop (D)
German Lop (G)
Lionhead (L)
Angora (A)

(a) Complete the table to show all the different pairs of breeds that Marcus could buy. You may not need all the spaces.

D D	**D G**		

[2]

(b) Marcus asks the pet shop owner for any two rabbits.
The pet shop owner makes a random selection from the completed table.

What is the probability that Marcus is **not** given a Lionhead rabbit?

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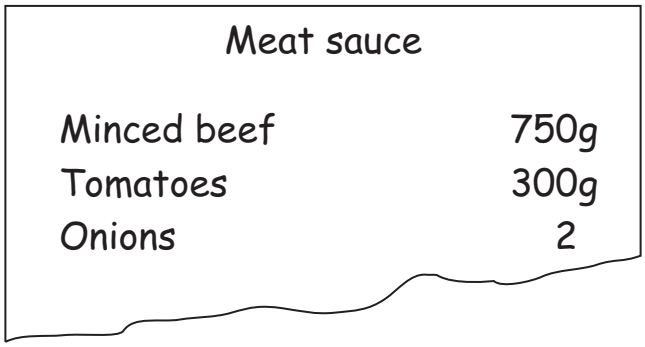
.....

(b) _____ **[2]**

9 Marnie is cooking meat sauce using these ingredients.



At her local shop, minced beef is £6.80 per kilogram, onions are 33p each and tomatoes are 48p for 100 g.

Marnie pays for the ingredients with a £20 note.

How much change should she get?

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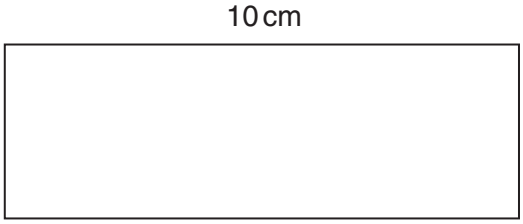
£ _____ **[6]**

10 **(a)** Work out the area of the rectangle.



NOT TO SCALE

.....

(a) _____ cm^2 **[2]**

(b) The rectangle in part **(a)** is enlarged.
Its perimeter is now 280 cm.
Huw says "The scale factor of the enlargement is 10."

Is Huw correct?
Show clearly how you decide.

.....

.....

_____

_____ **[2]**

11 **(a)** Work out the value of $10c + 20d$ when $c = 12$ and $d = 4$.

.....

.....

(a) _____ **[2]**

(b) Simplify.

(i) $m \times m \times m \times m \times m$

.....

(b)(i) _____ **[1]**

(ii) $8r + 2q + 3q - r$

.....

.....

(ii) _____ **[2]**

12 This stem and leaf diagram shows the time, in seconds, for each student from class 10A to run 100 m.

13	6	8					
14	0	0	3	7			
15	1	2	2	2	6	9	
16	0	1	4	5	7	7	8
17	0	3					
18	7						

Key: 15 | 1 represents 15.1 seconds

(a) What was the longest time taken to run 100 m?

.....

(a) _____ s **[1]**

(b) What is the range of the times?

.....

(b) _____ s **[2]**

(c) When students in class 10B recorded their times they had a range of 3.7 seconds.

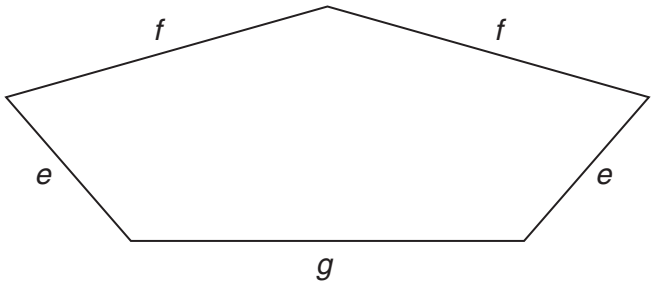
Geoff says "10B has a smaller range of times than 10A so they were faster."

Explain why Geoff is wrong.

_____

_____ **[1]**

13



NOT TO SCALE

(a) What is the mathematical name for this shape?

(a) _____ **[1]**

(b) The perimeter of the shape is given by this formula.

$$P = 2e + 2f + g$$

Work out e when $P = 33\,\text{cm}$, $f = 6.5\,\text{cm}$ and $g = 8\,\text{cm}$.

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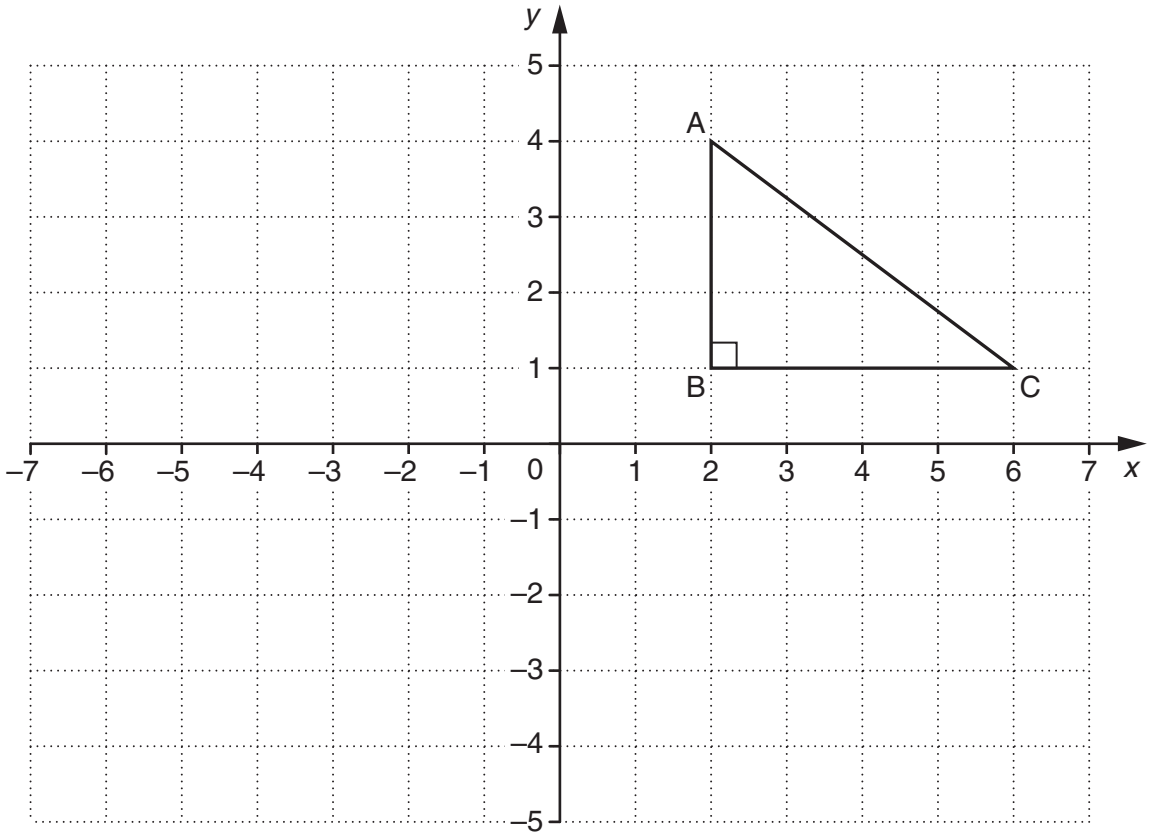
.....

(b) _____ cm **[3]**

14



(a) Reflect triangle ABC in the *y*-axis. **[2]**

(b) Angle A is 53°.

Calculate angle C.

.....

.....

(b) _____ ° **[2]**

(c) Triangle ABC is enlarged by scale factor 5.

How big is angle A in the enlarged triangle?

.....

(c) _____ ° **[1]**

15 **(a)** Calculate.

(i) 0.5×0.2

.....

(a)(i) _____ **[1]**

(ii) 5^3

.....

(ii) _____ **[1]**

(b) **(i)** Change $\frac{7}{8}$ into a percentage.

.....

.....

.....

.....

(b)(i) _____ % **[2]**

(ii) Use your answer to part **(b)(i)** to write $\frac{7}{80}$ as a percentage.

.....

(ii) _____ % **[1]**

16 Use ruler and compasses to construct a triangle with sides 9 cm, 7 cm and 6 cm.
The 9 cm side has been drawn for you.

Show all your construction arcs.

[3]

17 The table shows the ingredients needed to make vegetable soup for 4 people.

Vegetable soup (Serves 4 people)	
Vegetables	600 g
Stock	400 ml
Oil	3 tablespoons
Garlic	2 cloves

(a) What weight of vegetables is needed to make vegetable soup for 3 people?

.....

.....

(a) _____ g **[1]**

(b) How many tablespoons of oil are needed to make vegetable soup for 6 people?

.....

.....

(b) _____ **[1]**

(c) Matt has only 1 litre of stock.
He has plenty of the other ingredients.

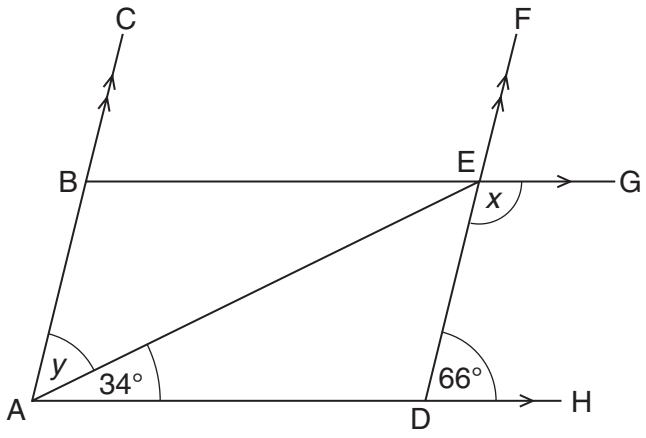
What is the maximum number of people he can make vegetable soup for?

.....

.....

(c) _____ **[2]**

18 In the diagram, ABC is parallel to DEF and BEG is parallel to ADH.
Angle EDH = 66° and angle EAD = 34°.



NOT TO SCALE

(a) Work out the size of angle *x*.
Give a reason for your answer.

.....

.....

Angle *x* = _____° because _____

_____ **[2]**

(b) Work out the size of angle *y*.
Give a reason for your answer.

.....

.....

Angle *y* = _____° because _____

_____ **[2]**

19 Solve.

(a) $2(3x + 7) = 26$

.....

.....

.....

.....

(a) _____ **[3]**

(b) $5x - 7 = 3x + 2$

.....

.....

.....

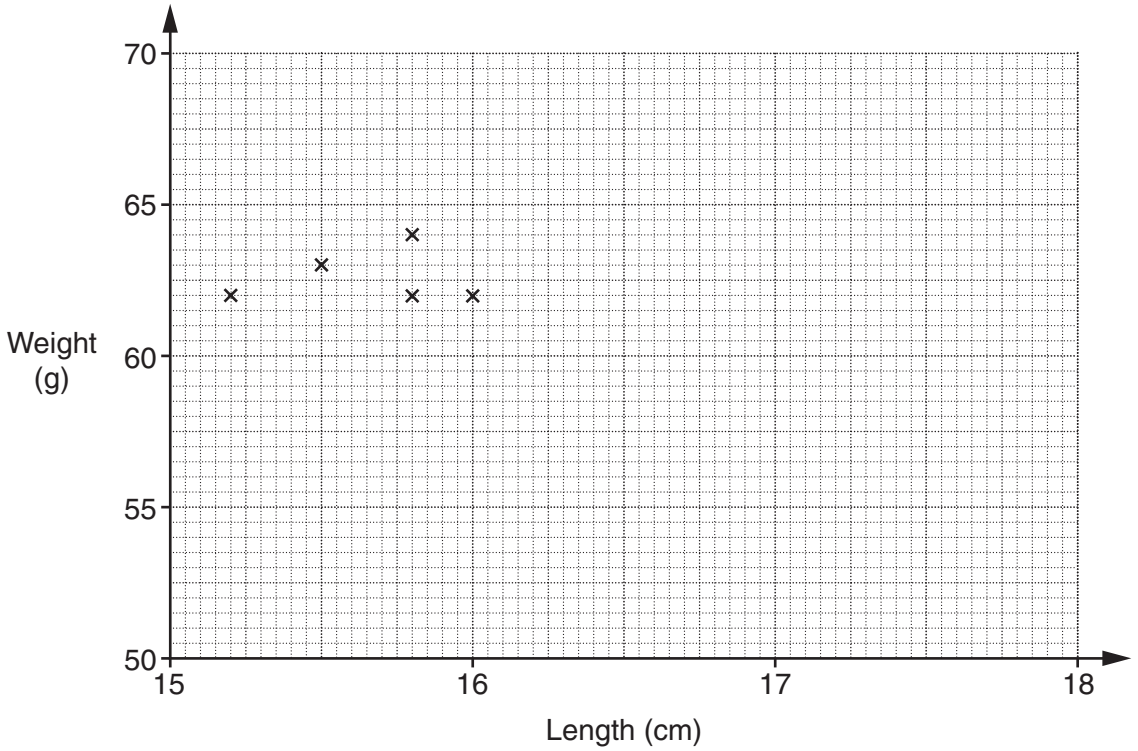
.....

(b) _____ **[3]**

20 The table shows the lengths and weights of nine guinea pigs.

Length (cm)	15.2	15.5	15.8	15.8	16.0	17.0	17.5	17.8	18.0
Weight (g)	62	63	64	62	62	65	70	66	67

(a) Complete the scatter diagram.
The first five points have already been plotted.



[2]

(b) Describe the correlation shown in the diagram.

(b) _____ **[1]**

(c) Draw a line of best fit on your diagram. **[1]**

(d) Another guinea pig is 16.5 cm long.

Use your line of best fit to estimate its weight.

(d) _____ g **[1]**

(e) Jill says 'If I could extend the horizontal axis and the line of best fit I could estimate the weight of a guinea pig which is 22 cm long'.

Explain why it would not be sensible for Jill to do this.

_____

_____ **[1]**

21 Work out.

(a) $\sqrt{10^3 - 4 \times 15^2}$

.....

.....

.....

.....

(a) _____ **[3]**

(b) $\frac{3}{4} \div \frac{7}{8}$

Give your answer as a fraction in its simplest form.

.....

.....

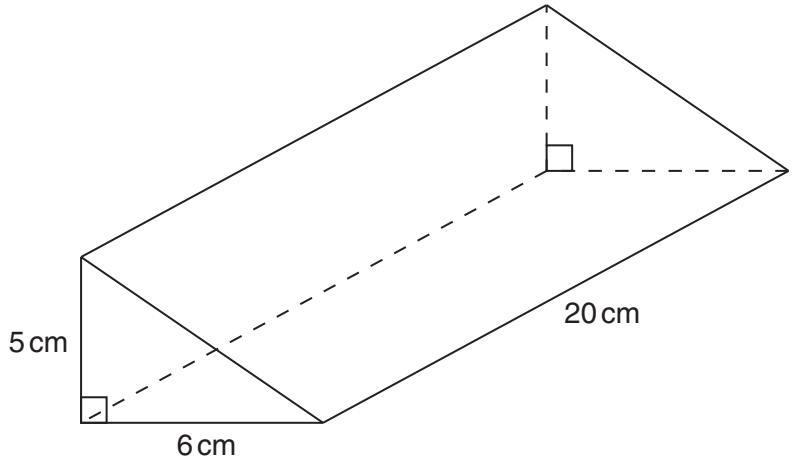
.....

.....

(b) _____ **[2]**

TURN OVER FOR QUESTION 22

22 A triangular prism has dimensions as shown in the diagram.



Work out the volume of the prism.

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.....

_____ cm^3 **[3]**