

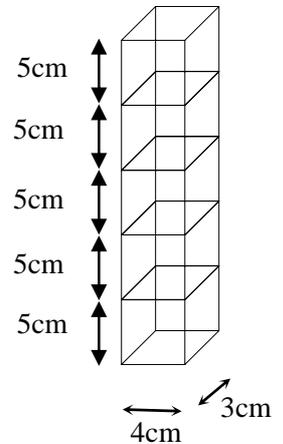
<b>DO NOT WRITE ON THIS PAPER</b>	<b>TIME</b> – 2 hours	<i>Paper 3 of 5 from ZigZag Education</i>
<b>Sample GCSE Examination Paper</b> <b>Intermediate tier non-calculator paper</b>	Standard Equipment: pen, pencil, ruler, compasses.	

1. Anita thinks of a number and trebles it.
- a) If her answer is 99 what did she start with? [1]
- b) If she started with  $x$  what did she end up with? [1]

2. A box has a width of 3cm, a length of 4cm and a height of 5cm.

- a) Calculate the volume of this box. [2]

There are many boxes like this one, all of the same size.  
They all have a width of 3cm, a length of 4cm and a height of 5cm.  
These boxes are placed onto a crate.  
The boxes are stacked so that they are 5cm high, as shown.



- b) How high are the boxes stacked? [1]

An empty crate has a width of 30cm, and a length of 40cm.  
The boxes fit exactly into the crate.

- c) How many boxes are on the bottom layer of the crate? [2]

3. 0.02 1.1 1.021 2.10 0.0123

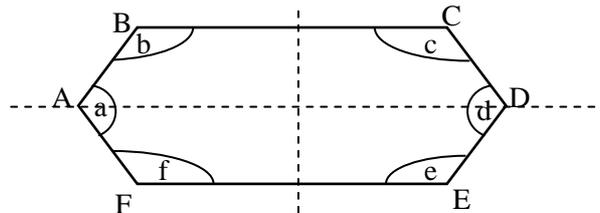
- a) List these numbers from smallest to largest. [1]
- b) Subtract the smallest number from the largest. [1]

4. a) The sticker price of the French Horn is £39  
How much is the French Horn after the sale? [3]



- b) Find an approximate answer to:  $999 \times 43$  Show all your working carefully for this question. [3]

5. a) Name the shape ABCDEF. [1]



The shape has rotational symmetry of order 2 and 2 lines of symmetry as indicated with dashed lines.  
The shape is re-constructed by moving point B, 1 cm to the right. One other point is also moved 1cm.  
Which other point was moved and in which direction, if the new shape has:

- b) a vertical line of symmetry and no rotational symmetry? [1]
- c) a horizontal line of symmetry and no rotational symmetry? [1]
- d) no lines of symmetry but does have rotational symmetry of order 2? [1]

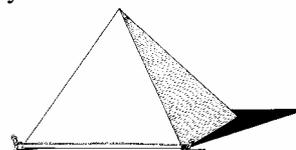
6. a) Sketch the net of a square-based pyramid. [1]

John makes this square-based pyramid.

He uses five pieces of card.

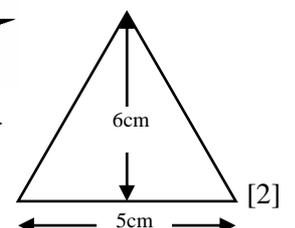
He uses four triangles, made of card, and one other piece.

The four triangles are like this one.



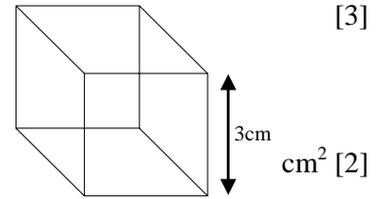
- b) Draw accurately and to scale the missing piece of card. [2]

*You do not need to show flaps.*



7. a) Draw the accurate net of a 6-sided cube whose sides are all 3cm long. [3]

The whole surface of the cube is painted.



- b) What area will be painted? [2]

8. Simplify the expressions:

a)  $2a + 3 - a + 1$  [1]

b)  $a^4 \times a^2$  [1]

c)  $2a \times 5b$  [1]

Solve the equation:

d)  $2(x + 2) = 10$  [3]

9. Evaluate:

a)  $3^3$  [2]

b)  $6^2$  [2]

10. A survey is carried out on 17 people in Summer and on some different people in Winter.

The survey involves both children and adults.

The people surveyed are summarised in this table:

	<i>Children</i>	<i>Adults</i>
Summer	10	7
Winter	8	15

- a) How many *children* were surveyed? [2]

- b) How many adults in winter were surveyed? [1]

One of the people surveyed is selected at random.

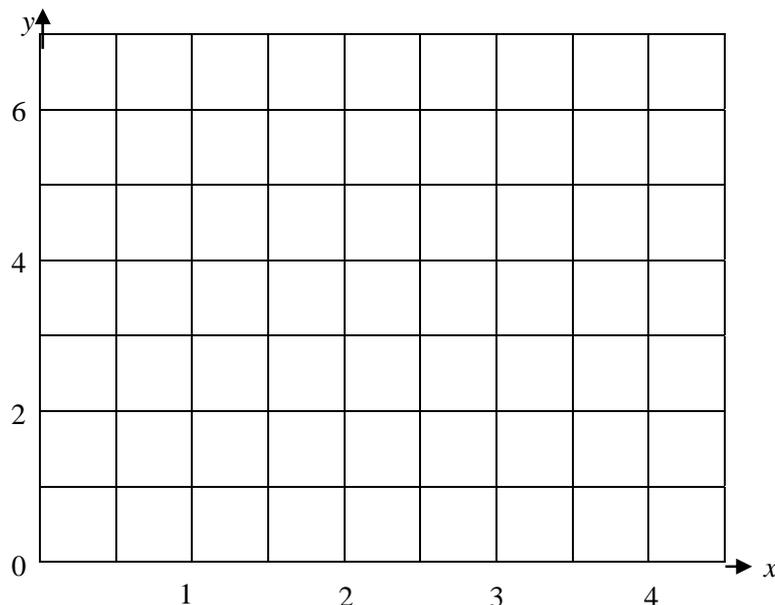
- c) What is the probability that the person is a child? Give your answer in its simplest form. [2]

- d) What is the probability that the person was surveyed in winter? Give your answer in its simplest form. [2]

11. a) Copy and complete the table and use these values to draw the graph of  $y = 2x + 1$  [4]

$x$	1	2	3
$2x + 1$			

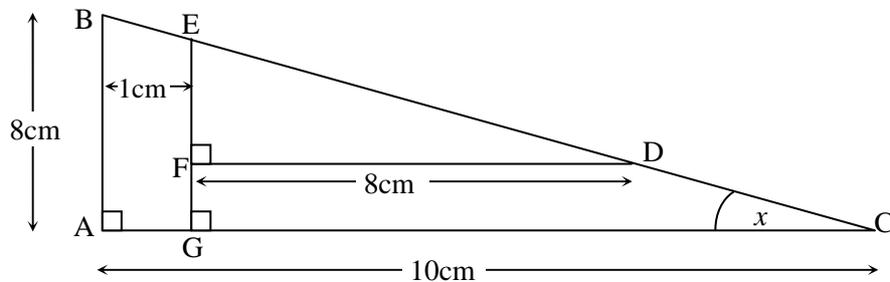
Copy this or use your own scale to draw your graph.





18. Simplify
- a) i)  $3p^3 \times 2p^3$   
 ii)  $\frac{9r^4}{6r^3}$
- b) i) Rearrange the equation  $m = 2r + 3st$ , making  $r$  the subject.  
 ii) If in the equation  $m = 2r + 3st$ ,  $r = -3$ ,  $s = -4$  and  $t = -5$ , find  $m$ . 5 marks

19. ABC, DEF and CEG are similar triangles.  
 AB and EG are parallel with the distance between them 1cm.



- a) i) Find the length BC, leaving your answer in the form  $\sqrt{n}$ , where  $n$  an integer.  
 ii) Simplify your answer  $\sqrt{n}$  into the form  $p\sqrt{q}$ , with  $p$ , and  $q$  are integers.
- b) Calculate the lengths EF and EG.
- c) i) Which angle in the diagram is equal to  $\angle EDF$ ?  
 ii) Given that  $\tan x = r$ , find  $r$ . 7 marks
20. In 2002 Jim records his first 5 golf scores as 68, 70, 71, 71, 73.  
 Jim records his scores in date order, so the 68 was his first score, 70 his second, etc.
- a) Calculate his average score.
- Jim then records his next 4 scores, in date order, as 68 70 71 68.
- b) Calculate the moving average based on 5 games at a time. 3 marks
21. a) Factorise the expression,  $x^2 - x - 6$  and hence solve the equation  $x^2 - x - 6 = 0$ .  
 b) Solve the equations:  
 i)  $2(x + 2) = x$   
 ii)  $\frac{2}{3}x = 19$   
 c) Solve the inequality,  $2 - 3x < 17$  8 marks