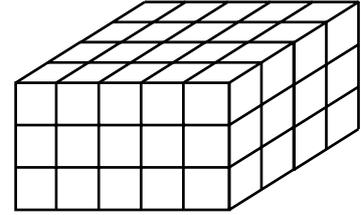


<i>DO NOT WRITE ON THIS PAPER</i>	<b>TIME</b> 2 hours	<i>Paper 1 of 5 from ZigZag Education</i>
<b>Sample GCSE Examination Paper Intermediate Tier Calculator Paper</b>	Standard Equipment: lined or squared paper, pen, pencil, ruler, CALCULATOR. Additional Equipment: Protractor Q6, graph paper Q16 . Squared paper Q2 Q7 & 11 & optionally tracing paper.	

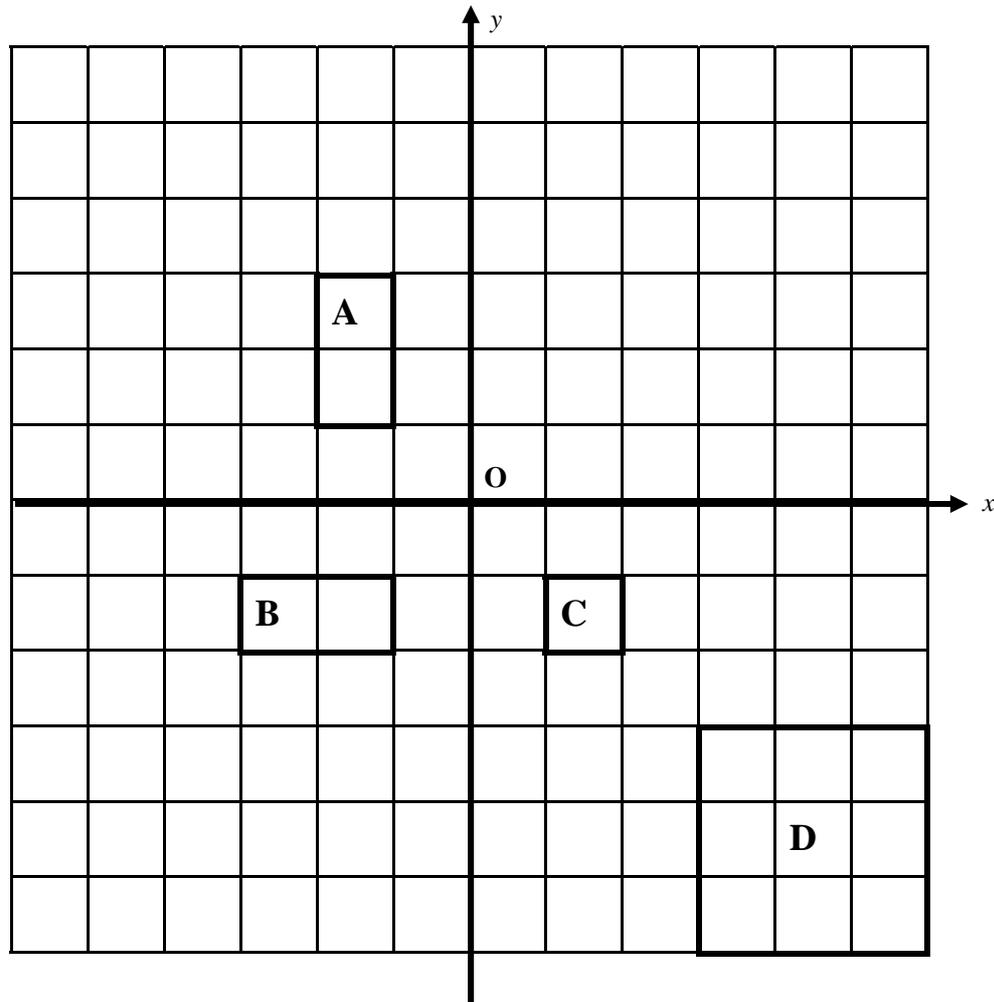
- 1 (a) A cuboid is constructed from cubes with sides of 1cm. It is five cubes long, four cubes wide and three cubes high, as shown. What is the volume of this cuboid?



cm<sup>3</sup> [2]

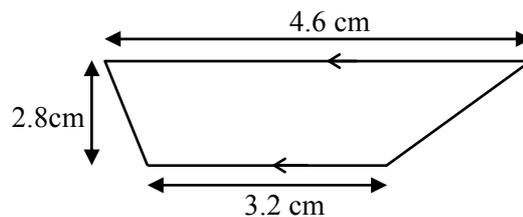
- (b) What is the area of the largest face of this cuboid? Give your answer in square centimetres.  
cm<sup>2</sup> [2]

- 2 (a)



O is the origin

- (i) Describe fully the transformation that maps A onto B [2]  
(ii) Describe fully the transformation that maps C onto D cm<sup>2</sup> [2]  
(b) Calculate the area of the following shape. cm<sup>2</sup> [3]

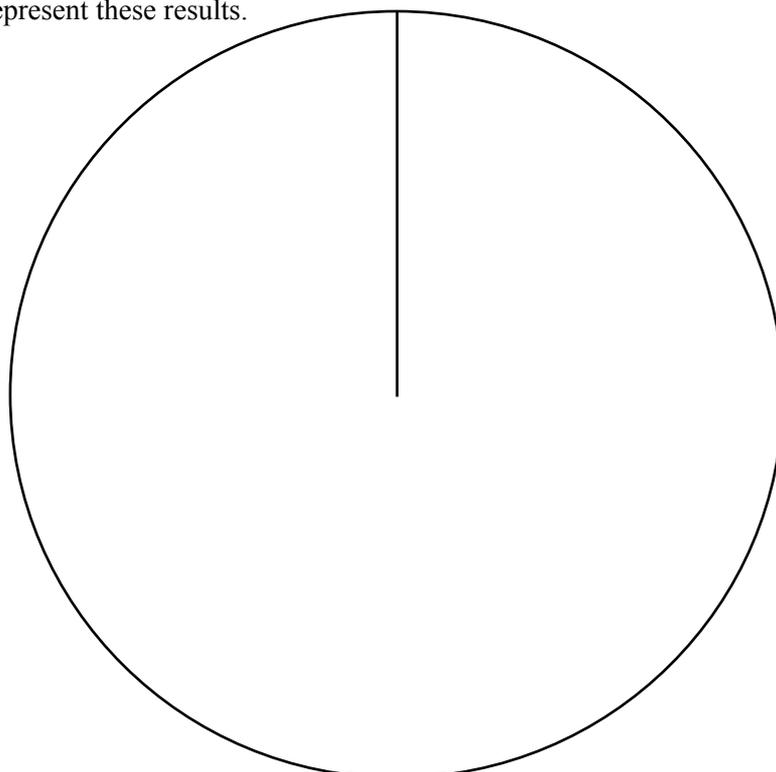


- 3** A two pint carton of milk costs 65p at the local supermarket.  
At the same supermarket, a four pint container of milk costs £1.19.
- (a) Which of the two quantities of milk is the better value for money?  
Explain how you reach your answer. [3]
- At a different supermarket, a one kilogram bag of sugar can be bought for £1.60.  
A smaller bag of sugar costs 45p.
- (b) Which of the two bags of sugar represents the better buy if the smaller bag of sugar weighs 250g?  
Explain your answer. [4]
- (c) A television set costs £800. In a sale, its price is reduced by 14%.  
What is the new price of the television set after the reduction? £ [3]
- 4** (a) Paperback books cost £4.50 each, and hardback books cost £6.50 each.  
Write down an expression for the cost, in pence, of  $x$  paperback books and  $y$  hardback books. [2]
- (b) Solve the equation  $6x + 5 = 29$   $x =$  [2]
- (c) When  $y = 3x + 2 - x + 3$ ,
- (i) Simplify the expression for  $y$   $y =$  [1]
- (ii) Find the value of  $y$  when  $x = 3$   $y =$  [1]
- (iii) Find the value of  $x$  when  $y = 17$   $x =$  [2]
- 5** Work out the following correct to two decimal places.
- (a)  $2.783^3$  (b)  $\frac{33.5}{\sqrt{63.2}}$  (c)  $\frac{6.7 + 2.9}{4.92 - 1.15}$  (d)  $5.5 - 3.2 \times 1.98 + 8.1$  [1][1][2][1]

- 6** A survey was carried out to find out the favourite colours of 120 children.  
The results were shown in a pie chart.
- (a) In this pie chart, the yellow area covered an angle of  $63^\circ$ .  
How many of the children asked said that yellow was their favourite colour? [2]
- (b) Another 120 children were asked the same question at another school.  
The results are shown in the table below.

Colour	Red	Blue	Yellow	Green	Other
Number of children	38	26	18	22	16

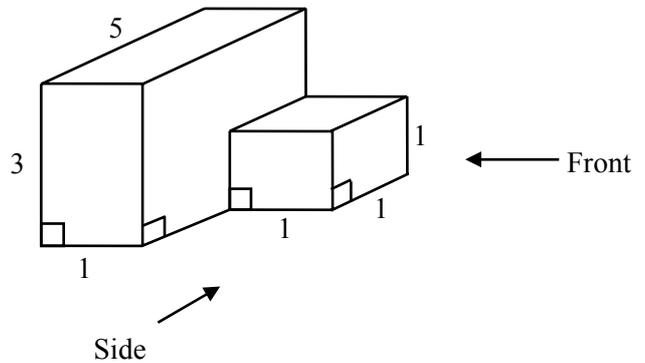
Draw a pie chart to represent these results. [3]



Not to scale

7 The drawing shows a three dimensional solid

All measurements  
in cm



(a) **On squared cm paper**, draw front and side elevations of this solid. [3]

(b) What is the total volume of the solid drawn above? [2]

cm<sup>3</sup>

8 The table shows the heights of all the basketball players taking part in a competition.

Height (h cm)	No. of players
$h \leq 170$	12
$170 < h \leq 180$	16
$180 < h \leq 190$	19
$190 < h$	13

(a) How many basketball players were taking part in this competition? [1]

(b) How many basketball players were more than 170cm tall? [1]

(c) What percentage of all the players were more than 170cm tall? % [1]

(d) One of the players is chosen at random.

Calculate the probability that player is shorter than 170cm. [1]

9. A biased 4 sided die is thrown 100 times and results summarised in the table below. Estimate the probability that the next throw of the die is a 1.

SCORE	FREQUENCY
1	19
2	11
3	39
4	31

1 mark

10. Simplify the expressions

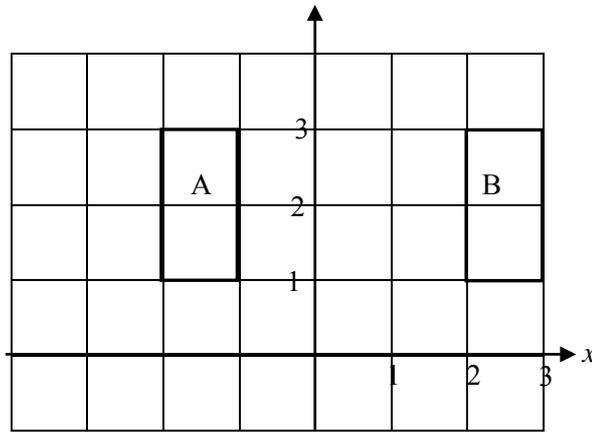
a)  $x^5 \times x^5$

b)  $\frac{6x^5}{3x}$

c)  $(x^5)^3$

3 marks

11.

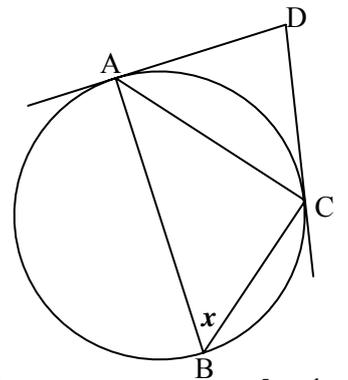


- Fully describe a rotation that maps A to B.
- Fully describe the translation that maps A to B.
- Fully describe the reflection that maps A to B.

5 marks

12. AD and CD are tangents to the circle. AB is a diameter. Angle ABC is  $x^\circ$ . ABC and ACD are special types of triangle.

- What type of triangle is ABC, and explain how you know this to be true.
- What type of triangle is ACD, and explain how you know this to be true.
- Work out an expression in terms of  $x$  for the size of angle BAC. 6 marks

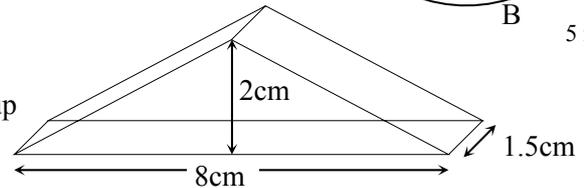


5 marks

13. John and Jim share £100 in ratio 2:3

- How much does John receive?
- Jill and Sunita share £100 in ratio  $a : b$ . Jill gets 39.75. If  $a = 159$  find  $b$ .

14. The surface of the following solid prism is made up from 3 rectangles and two isosceles triangles. Calculate the surface area of the solid.



4 marks

- Make  $j$  the subject of the formulae  $m = 3j + 3$ .
- Make  $r$  the subject of the formulae  $V = \frac{1}{3}\pi r^3$ .
- Make  $w$  the subject of the formulae  $pw = w + 1$ .

7 marks

16. The following table shows the results of 7 students' Mathematics examination results.

Student	Paper 1	Paper 2
1	69	61
2	33	24
3	26	16
4	45	43
5	78	54
6	94	77
7	66	44

- With paper 1 on the horizontal axis and paper 2 on the vertical axis, draw a scatter diagram to show the results.
- If appropriate draw on a line of best fit.
- Describe any correlation.

Joan, who was student 8, sat paper 2 and scored 50. Joan was ill for paper 1.

The examination board would like to know what Joan would have scored should she have been well.

- Use your graph to estimate Joan's most likely result for paper 1.

6 Marks

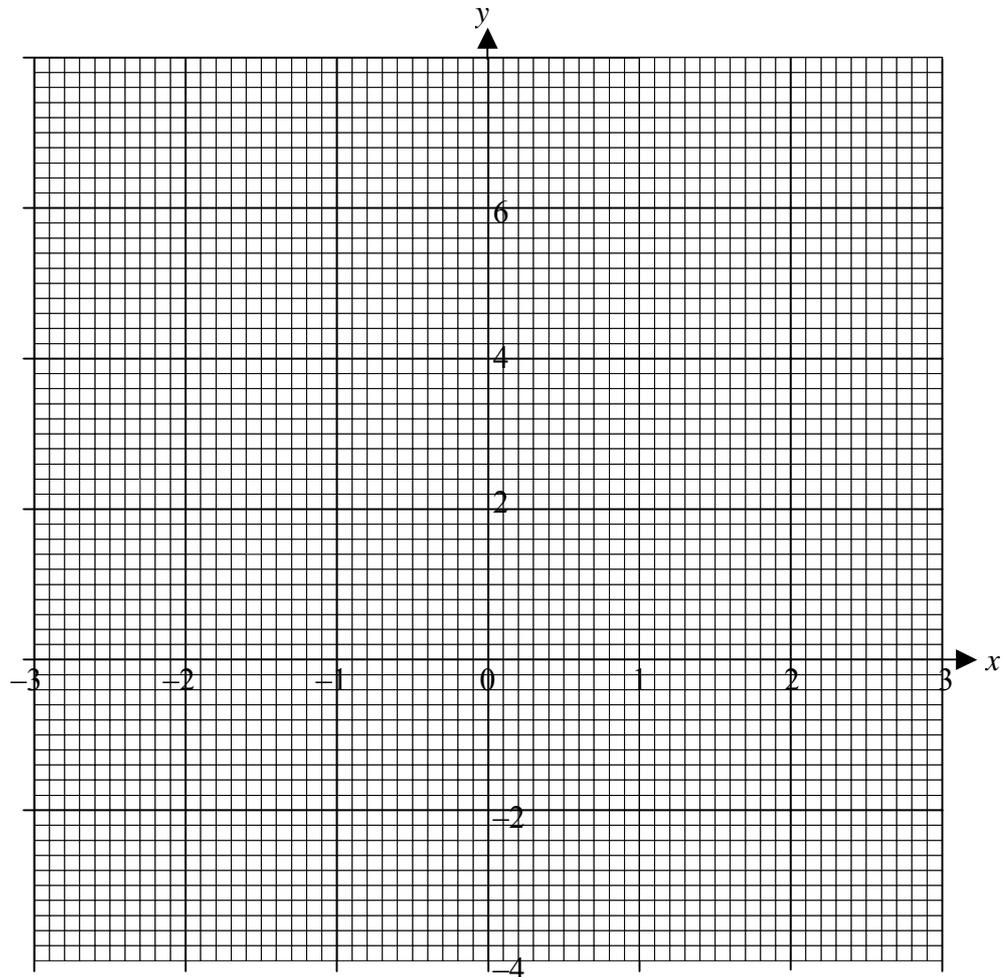
- Factorise the expression,  $x^2 + 5x + 6$  and hence solve the equation  $x^2 + 5x + 6 = 0$ .
- Solve the equations:
  - $2x + 3 = 3x - 3$
  - $\frac{2}{3}x = \frac{4}{7}$
- Solve the inequality,  $2 + 3x < 17x$

8 marks

18. a) Copy and complete the table of values for  $y = x^2 - 2x - 2$

$x$	-2	-1	0	1	2	3
$y = x^2 - 2x - 2$	6			-3		1

- b) Copy and complete the axis onto graph paper and using the same scale and using the values from your table draw the graph of  $y = x^2 - 2x - 2$ .
- c) Use your graph to solve the equation  $0 = x^2 - 2x - 2$ . 5 marks



19. Chloë is taking part in the Great West Gliding Race. She glides between Bristol and Exeter and back to Bristol. The distance from Bristol to Exeter is 120km. From Bristol to Exeter, her average speed is  $x$  km/h. On the return route, a following wind increases her speed to  $x + 10$  km/h.

Express the time taken for Chloë to complete the race in terms of  $x$ .

2 marks