

DO NOT WRITE ON THIS PAPER	TIME – 2 hours	Paper 1 of 5 from ZigZag Education
Sample GCSE Examination Paper Intermediate tier non-calculator paper	Standard Equipment: pen, pencil, ruler, protractor. Compasses (Q15).	

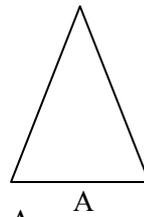
1. Below are the results from a child's spelling tests over a term.
3 3 5 5 5 5 6 7 9 10
Calculate the mean mark over the whole term. [3]

2. (a) Simplify the expression: $7x + 5x + 3x$. [1]
(b) Solve the following equations:
(i) $12x = 48$ [1]
(ii) $8 + x + 6 + 2x = 17$ [2]
(c) For the formula $f = 3s - 4$ find the value of f , when $s = 7$. [1]

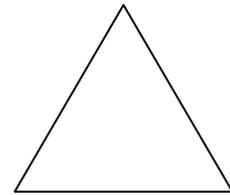
3. (a) Write the three missing terms of the sequence
15 21 ___ 33 ___ ___ [2]
(b) Write down the values of the following, in the simplest form.
(i) $\sqrt{64}$ [1]
(ii) 10^2 [1]
(iii) 2^3 [1]

4. Here are two triangles.

Triangle A has two sides the same length.
Triangle B has all its sides the same length.



A



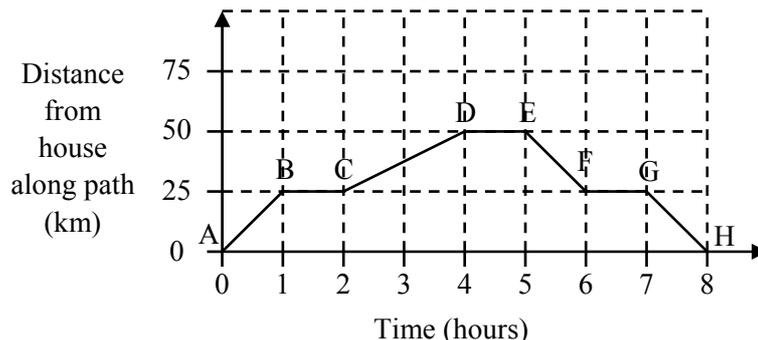
B

- (a) (i) Write down the special name for triangle A. [1]
(ii) Write down the special name for triangle B. [1]
(b) (i) Write down the order of rotational symmetry for triangle A. [1]
(ii) Write down the order of rotational symmetry for triangle B. [1]
5. A car mechanic buys engine oil in 1.5 litre bottles. He buys 7 bottles.
(a) How many millilitres of oil does the mechanic have? [2]
(b) The mechanic pours 3000cm^3 of the oil into a cuboid tank, the base of the tank measures $50\text{cm} \times 20\text{cm}$.
What height would the tank have to be, for it to be full of oil? [5]
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6. (a) Simplify
 $6r + 5s - 3s + r$ [1]
(b) Factorise
 $x^2 + 7x$ [1]
(c) Solve the equations–
(i) $4(3x + 5) = 38$ $x = [3]$
(ii) $27 + 3x - 9 = 9x$ $x = [3]$
7. Estimate the answer to the following: $\frac{10.33 + 889}{101 - 1.01}$ [2]

8. Rose goes for a bike ride down a long path, from her house to a church. She then returns back down the path, from the church to her house.

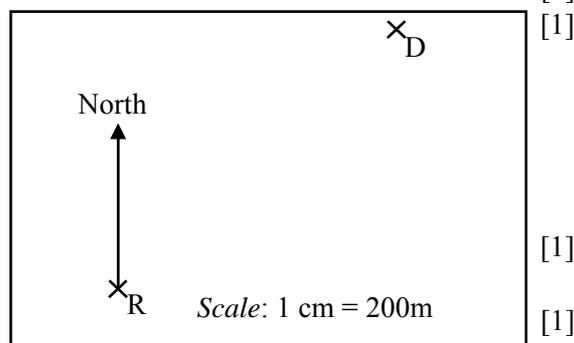


Her ride is represented by this graph.



- (a) How far is the church from the house along the path? [1]
 (b) During her cycle Rose takes rests and sits down. [1]
 (i) How many hours in total during the cycle is Rose stopped for? [1]
 (ii) How many hours is she away from the house? [1]
 (iii) What is her average speed during her first hour's cycle? [1]
 (iv) On which section did she cycle slowest? [1]

9. **Copy the diagram.** The diagram shows the position of, Rose's house (R) and Damian's house (D).



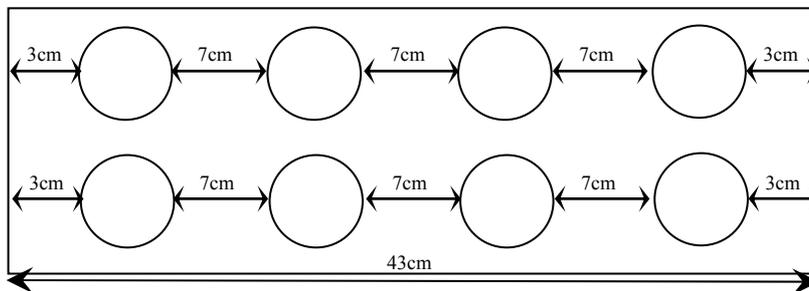
- (a) Measure and use the scale to work out the true distance of R from D. [1]
 (b) Measure and write down the bearing (in degrees) of D from R. [1]

10. Below is a recipe for making a cake. To make one cake you will need:

- 150 g Self raising flour
- 150 g Sugar
- 3 eggs
- ½ pint of milk

- (a) Complete the list of ingredients to make 8 cakes. [1]
 (i) Self raising flour g [1]
 (ii) Sugar g [1]
 (iii) Eggs [1]
 (iv) Milk pints [1]

- (b) The cakes are baked in the following baking tray. [not drawn to scale]



The cake mixture is placed in the circular spaces, making cylindrical cakes.

This diagram represents one of the cakes.

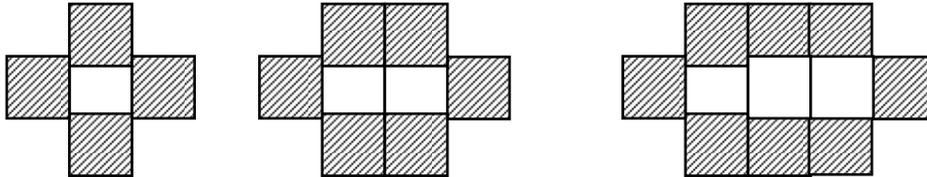


- (i) Calculate the diameter of each of the cakes. cm [2]
 (ii) Calculate the shaded area of the cake shown in the diagram. cm² [3]
 Take the value of π to be 3.14.

11. a) Solve the inequality $3x + 2 \leq 5$
Solve the following equations:
- b) $x^2 = 9$ c) $\frac{x}{2} + \frac{x}{3} = 2$ d) $\frac{x+1}{2} + \frac{x}{3} = 1$ 7 marks

12. a) Write down the next 2 numbers in the sequences
i) 1, 5, 9, 13, ...
ii) 2, 5, 10, 17, 26, ...
b) Determine a formula for the n^{th} term of each of the above sequences?

Consider the following pattern:



- c) How many dark squares will there be when there are 100 white squares?
d) How many dark squares will there be when there are n white squares? 6 marks

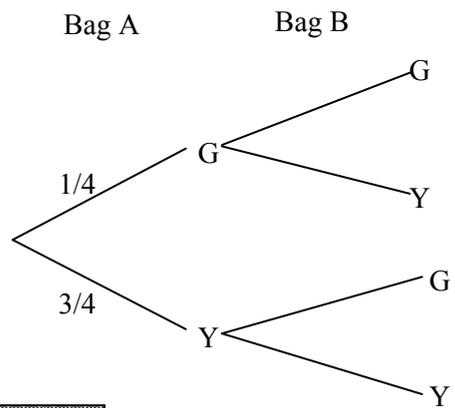
13. X and Y are lengths.
 $J = X^2 + Y^2$
 $K = 2X + Y$
- a) State whether J represents i) a length ii) an area iii) a volume iv) none of the previous
b) State whether K represents i) a length ii) an area iii) a volume iv) none of the previous 2 marks

14. a) Write 120 as the product of primes.
b) Write 1.234×10^{-5} as an ordinary number.
c) Estimate: $\frac{13.8 \times 0.022}{133}$ 4 marks

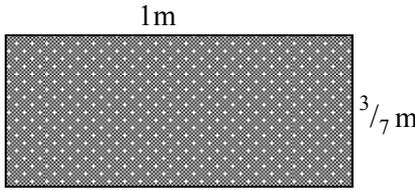
15. a) Construct a triangle ABC such that $AB = 10\text{cm}$ $BC = 9\text{cm}$ and $AC = 8\text{cm}$. 4 marks
b) Shade all the points inside the triangle that are within 3cm of AB and are nearer to AB than BC.

16. Bag A, and bag B both have green and yellow balls in.
The ratio of green to yellow balls in bag A is 1:3.
The ratio of green to yellow balls in bag B is 1:4.
The number of balls in each bag is the same.
a) Calculate the smallest number of balls that can be in bag A.

- A ball is selected at random from each bag.
b) Copy and complete the tree diagram.
c) Calculate the probability that both balls are of the same colour. 6 marks



17. I have enough paint for 100m^2 .
I am painting the front of these panels.
How many complete panels do I have enough paint for?



2 marks

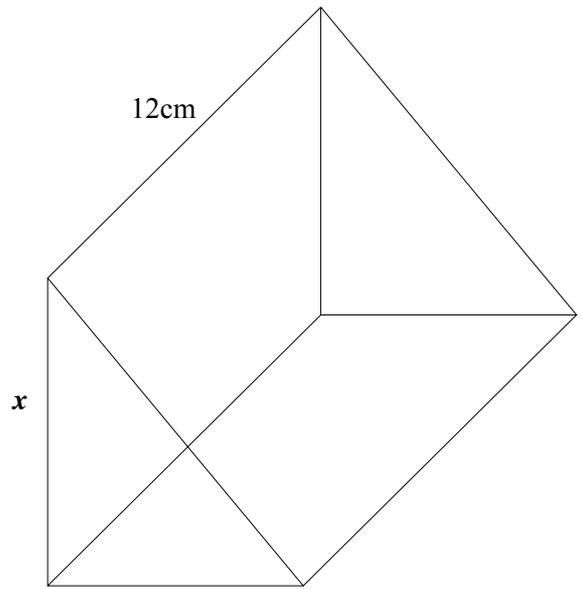
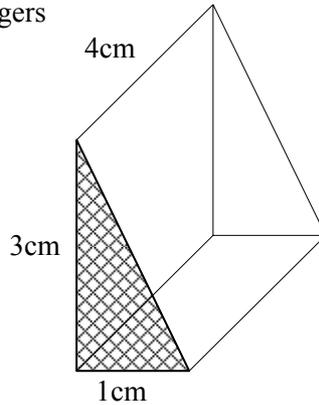
18. The share price of a company was recorded every quarter for two years. The results are shown in the table below.
- Find a four point moving average for the data.
 - Comment on the trend of the moving average.

	1998	1999
1 st quarter	£1.80	£2.00
2 nd quarter	£2.00	£2.20
3 rd quarter	£2.10	£2.30
4 th quarter	£2.10	£2.30

4 marks

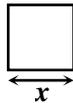
19.
 - Calculate the area shaded.
 - Calculate the volume of the smaller prism.
 The two prisms are similar.
 - Calculate the missing length x .
 The surface area of the smaller prism is given by: $a + b\sqrt{c}$ where a , b and c are integers
 - Find a , b and c .

Not to Scale



7 marks

20. Here are two squares.



Not drawn accurately

The perimeter of the bigger square is 4cm more than the smaller one.

- Work out an expression in terms of x for the difference in the areas of the 2 squares, and simplify your answer.

The difference between the area of the small square above and an even smaller square is given by the expression: $6x - 9$.

- Find an expression for the perimeter of the smallest square in terms of x .

8 marks