

Annual Examinations for Middle Schools 2023

YEAR 8

MATHEMATICS

TIME: 1h 30min

Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calc	Total
Mark																

DO NOT WRITE ABOVE THIS LINE

Name: _____ Class: _____

Answer ALL questions.
Calculators are allowed. All necessary working must be shown.

1. Alex is playing with a six-sided dice and a three-sided spinner with the numbers 2, 5 and 8 marked on it. He tosses the dice and spins the spinner at the same time. He records the outcome in the possibility space below.

- a) Complete the table below to show all the possible outcomes.

		Dice					
		1	2	3	4	5	6
Spinner	2	(1,2)	(2,2)				
	5				(4,5)		
	8			(3,8)			(6,8)

- b) Find the probability that:

- i) Both numbers are even

Ans: _____

- ii) Both numbers are prime

Ans: _____

- iii) The total of the two numbers is greater than 12

Ans: _____
(5 marks)

2. a) Make c the subject of the formula.

$$a = 2c + b$$

Ans: _____

- b) i) A number m is doubled. Then 6 is added to the result.

Write an expression in terms of m .

Ans: _____

- ii) The same number m is multiplied by 4. Then 8 is subtracted from the result.

Write another expression in terms of m .

Ans: _____

- iii) The expressions obtained in i) and ii) are equal.

Form an equation and solve it to find m .

Ans: $m =$ _____

- c) Solve the equation: $4x + 2 = 2(3x - 7)$

Ans: $x =$ _____

(10 marks)

3. Sue and Paul are shopping for appliances. They want to buy the two items shown below for their home.



Sue and Paul need to choose between two discount options.

Option A: 5% discount on the total cost of the two items.

Option B: €10 off the total when spending more than €100.

- a) Which is the better option and by how much?

Ans: Option _____ is the better option by €_____

Sue says: "There is a way to get a better discount. Let us pay separately for the two items!"

- b) Is Sue's argument right or wrong? Explain, showing your working.

Ans: Sue is _____ (right / wrong)

(8 marks)

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4. The volume of a cube is 343 cm^3 .

- a) Find the length of one side of the cube.

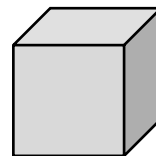


Diagram not drawn to scale

Ans: _____

- b) Use your answer in part (a) to calculate the surface area of the cube.

Ans: _____

(5 marks)

5. The diagram below shows a parallelogram. Work out the values of angles a and b .
Give reasons for your answers.

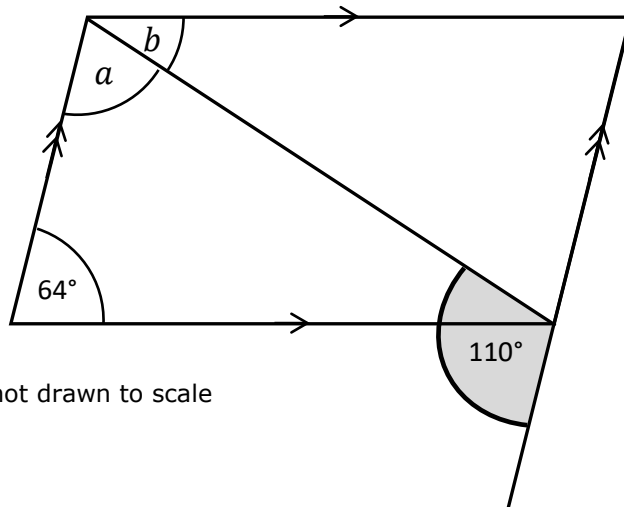


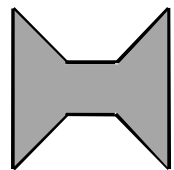
Diagram not drawn to scale

Ans: $a =$ _____ Reason: _____

Ans: $b =$ _____ Reason: _____

(4 marks)

6. a) The shaded shape has rotational symmetry of order _____.



- b) Daniel draws a symmetrical shape as shown below.
Work out the area of the shape.

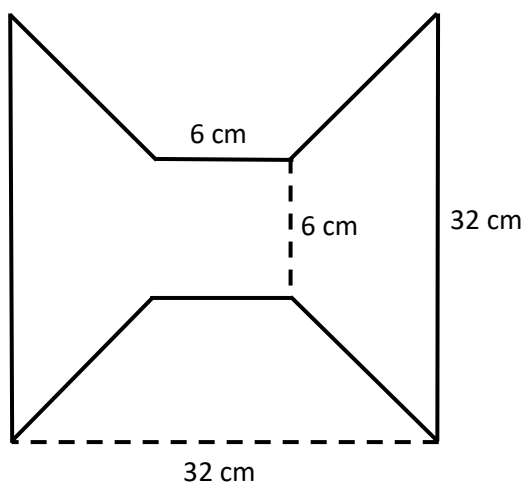
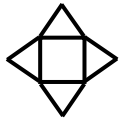


Diagram not drawn to scale

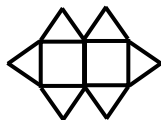
Ans: _____

(6 marks)

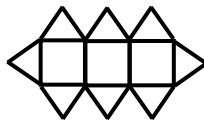
7. Here is a sequence of patterns made up of squares and triangles.



Pattern 1



Pattern 2



Pattern 3

Pattern 4

- a) In the space provided above, draw pattern 4.
b) Fill in the table below.

Pattern No	1	2	3	4	5	6
No of squares	1					
No of triangles	4					
Total	5					

(4 marks)

8. a) Draw a circle of radius 3 cm. Label the centre O.

- b) Use your compasses to construct a regular hexagon of side 3 cm inside the circle. Label the hexagon ABCDEF.
c) On your construction, draw the radii OA and OC.
Use your protractor to measure angle AOC.

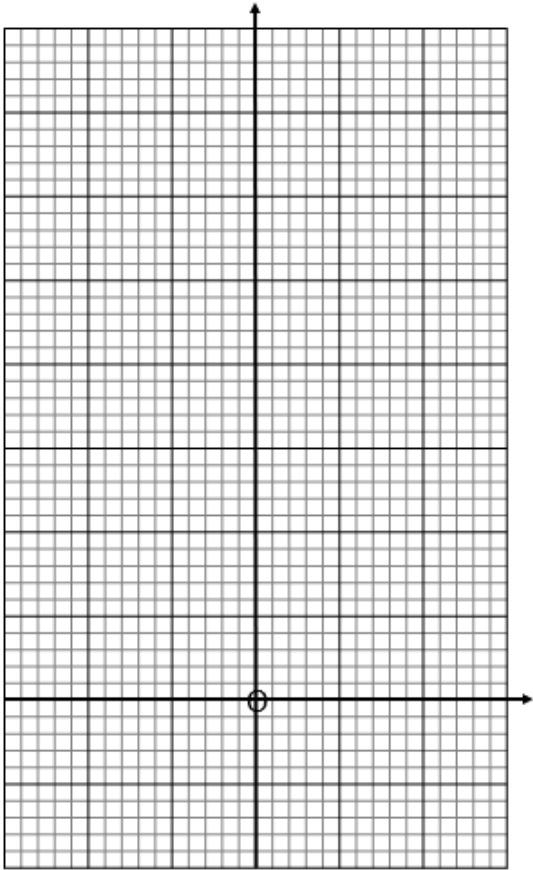
Ans: _____

(4 marks)

9. a) Complete the table for the equation $y = 2x + 3$.

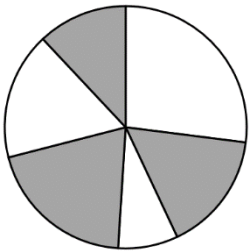
x	-2	-1	0	1	2
$2x$		-2			4
$+3$		+3			+3
y		1			7

b) Label and draw the graph of $y = 2x + 3$.



(5 marks)

10. The diagram shows a circle of radius 8.3 m.
a) Find the area of the circle correct to 1 decimal place.



Ans: _____

b) The area of the shaded parts is 104 m^2 . Express this quantity as a percentage of the area of the whole circle, correct to the nearest whole number.

Ans: _____

(4 marks)

11. Helen buys 17 scarves costing £8.25 each. She pays £11.55 shipping fees on the whole package.

a) Work out the total cost in Great British Pound (GBP £).

Ans: _____

b) Use the exchange rate 1GBP = Eur 1.1675 to change the total cost into Euro (€), to the nearest cent.

Ans: _____

c) Helen is selling the scarves. Work out the selling price of each scarf in Euro if she wants to make a profit of 25%. Give your answer to the nearest Euro.

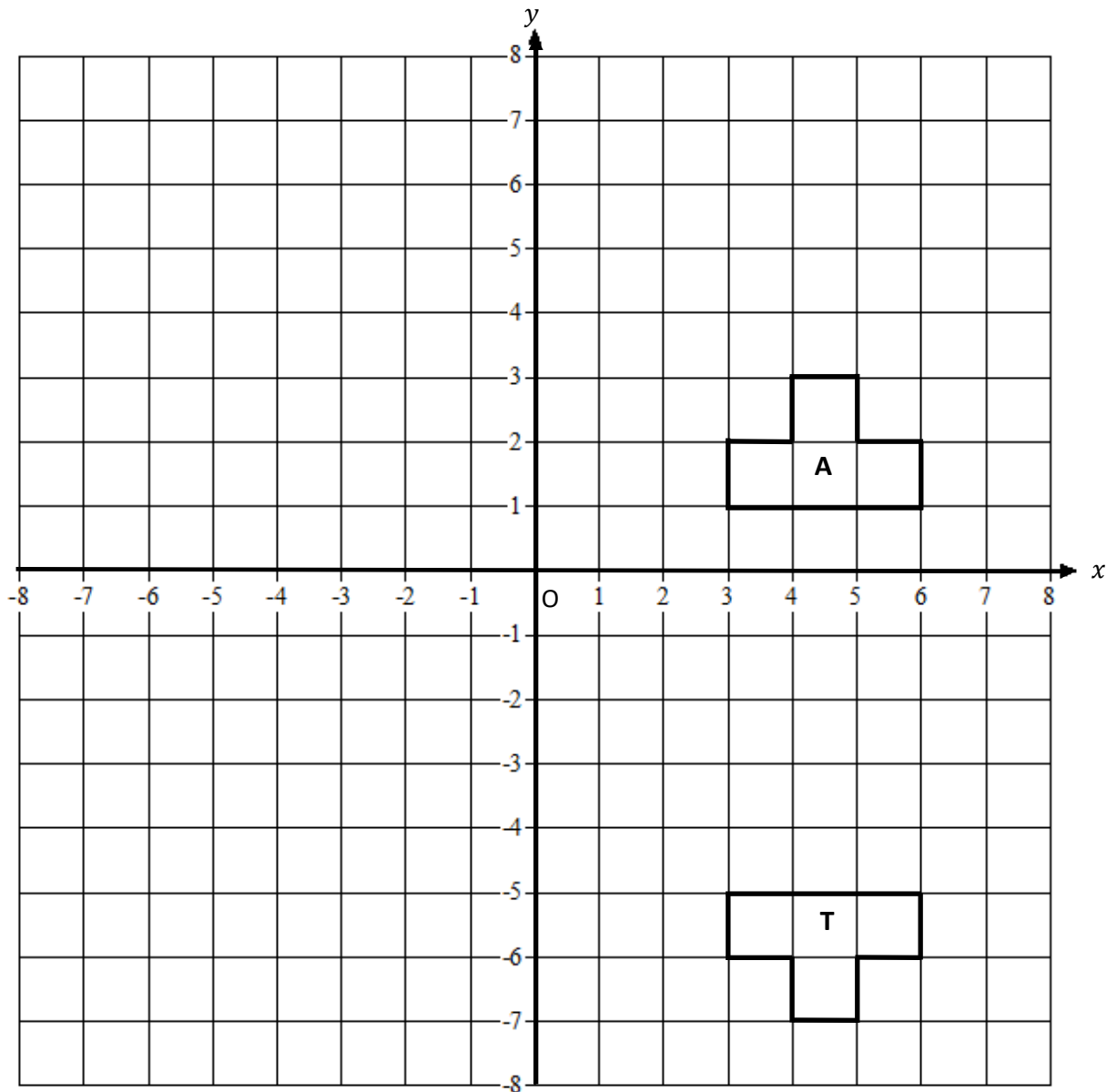
Ans: _____
(8 marks)

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12. Five cousins are playing together at their grandmother's house.
The mean age is 13 years.
The median age is 14 years.
The modal age is 15 years.
The range is 6 years.
Work out the ages of the five cousins.

Ans: _____

(5 marks)

13.



- a) Reflect shape A in the line $y = x$. Label the shape B.
- b) Rotate shape A 180° about the origin O. Label the shape C.
- c) Translate shape A by column vector $\begin{pmatrix} -2 \\ -4 \end{pmatrix}$. Label the shape D.
- d) Describe the single transformation that maps shape A to shape T.

The transformation is a _____

(7 marks)

End of Main Paper