

Annual Examinations for Middle Schools 2022

YEAR 8

**MATHEMATICS
MAIN PAPER**

TIME: 1h 30min

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

DO NOT WRITE ABOVE THIS LINE

Name: _____

Class: _____

Calculators are allowed but all necessary working must be shown.

Answer ALL questions.

1. Use your calculator to find the value of the following:

a) 11.8^2 correct to 1 decimal place

Ans: _____

b) $\frac{2}{9}$ of 540 metres

Ans: _____ m

c) $472.385 - (13.111 + 1.48)^2$
correct to 3 decimal places

Ans: _____

d) $\sqrt{138 \times 2.4}$ correct to 2 decimal places

Ans: _____

(5 marks)

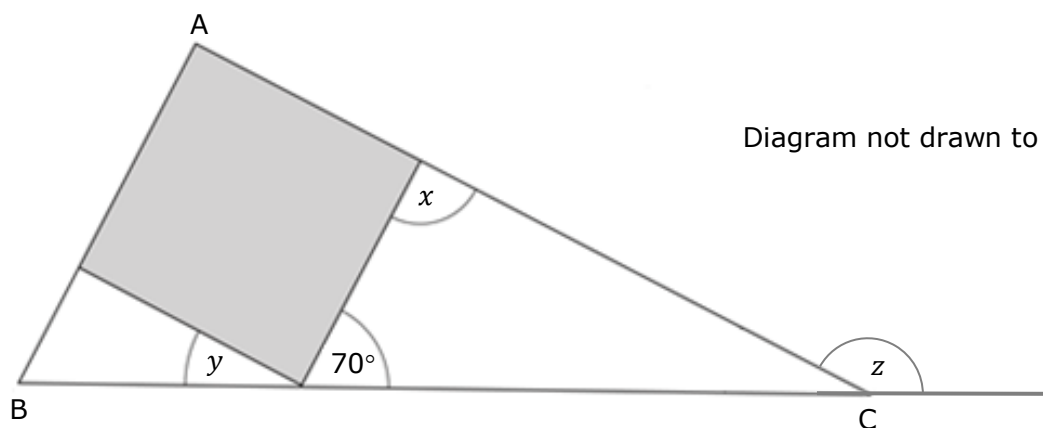
2. Share €500 between Martina and Kelsey in the ratio 3 : 5. Show your working.

Ans: Martina €_____

Ans: Kelsey €_____

(2 marks)

3. In the shape below, the shaded square fits perfectly in triangle ABC.



Find the values of the angles marked x , y and z . Give reasons for your answers.

$x =$ _____ Reason: _____

$y =$ _____ Reason: _____

$z =$ _____ Reason: _____

(5 marks)

4. a) Expand and simplify: $5(x - 4) - 3x + 2$

Ans: _____

b) Make y the subject of the formula: $11 - y = x$

Ans: _____

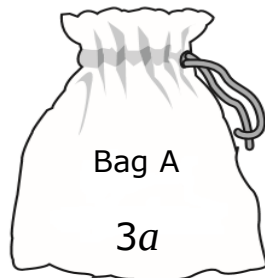
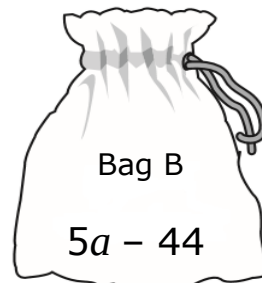
c) i) A number x is equal to the sum of a number y and twice a number z .
Write down a formula for x in terms of y and z .

Ans: _____

ii) Find the value of x when $y = 5$ and $z = -7$.

Ans: $x =$ _____

d) i) The two bags below contain the **same** number of marbles.
Bag A contains $3a$ marbles and Bag B contains $5a - 44$ marbles.



Write down an **equation** and solve it to find the value of a .

Ans: $a =$ _____

ii) Find the number of marbles in Bag A.

Ans: Bag A = _____ marbles

(9 marks)

5. A sports club has 50 members. In 2020, the club's total income came from a sponsorship and members' fees as follows:

- Sponsorship €1500
- Members' fees €25 per month (each member)

a) i) Work out the total income of the club for the year 2020.

Ans: € _____

ii) Write the sponsorship as a fraction of the club's total income in 2020.
Give your answer in its simplest form.

Ans: _____

b) In 2019, the club's total income was €20 000.
The club spent 35% of its total income on new sports equipment.
It spent a further €2500 on prizes.
The club also spent $\frac{1}{10}$ of its total income on maintenance.

i) Find the total amount spent in 2019.

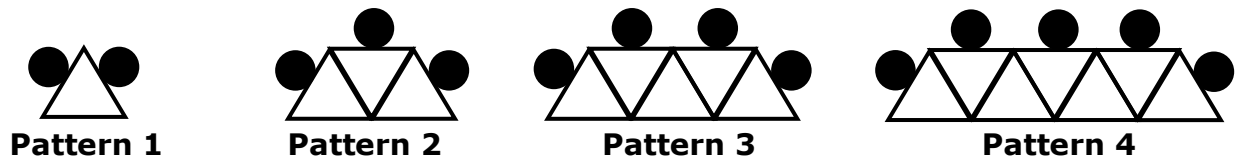
Ans: € _____

ii) Find the profit made in 2019.

Ans: € _____

(7 marks)

6. The following is a sequence of patterns made from triangles and circles.



a) Make a sketch of Pattern 5 in the space below.

b) How many circles are needed for Pattern 6?

Ans: _____ circles

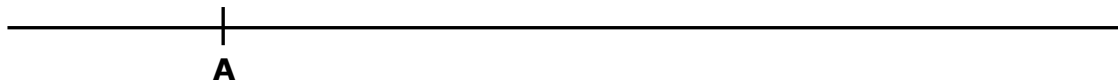
c) One of the patterns has exactly 10 circles. How many triangles does this pattern have?

Ans: _____ triangles

(4 marks)

7. In this question, use ruler and compasses only.

- a) Mark a point B on the given line so that $AB = 6$ cm.
- b) Construct two perpendicular lines, one at point A and another at point B.
- c) Complete the construction to form square ABCD.
- d) Measure the length of AC, the diagonal of the square. $AC = \rule{1cm}{0.4pt}$ cm



(6 marks)

8. a) Find the area of a circle of radius 3 cm. Give your answer correct to 1 decimal place.

Ans: _____ cm²

b) Amanda designs a logo for her new business. The logo consists of two identical trapezia and two white circles of radius 3 cm.

Find the area of the shaded part of the logo.

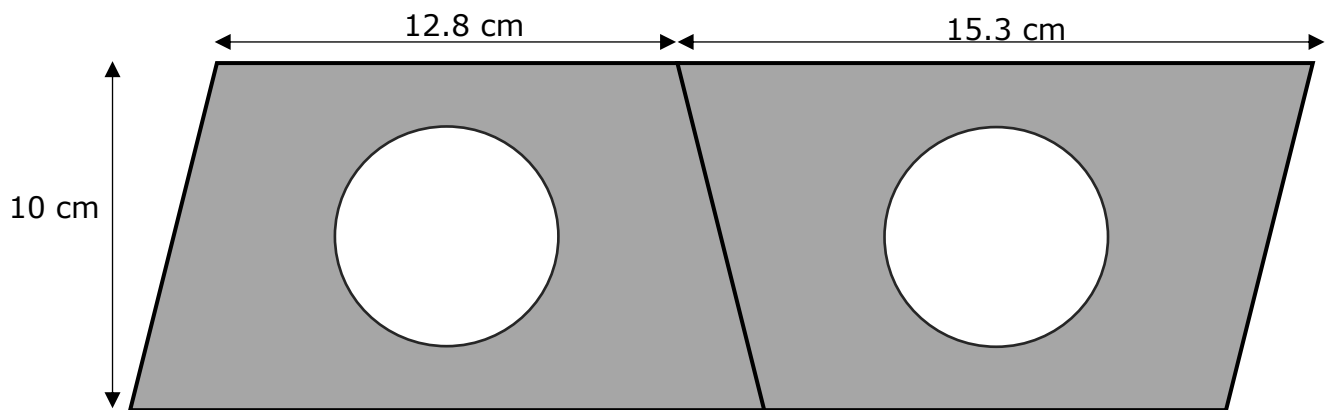


Diagram is not drawn to scale

$$\text{Area of Trapezium} = \frac{(a + b)}{2} \times h$$

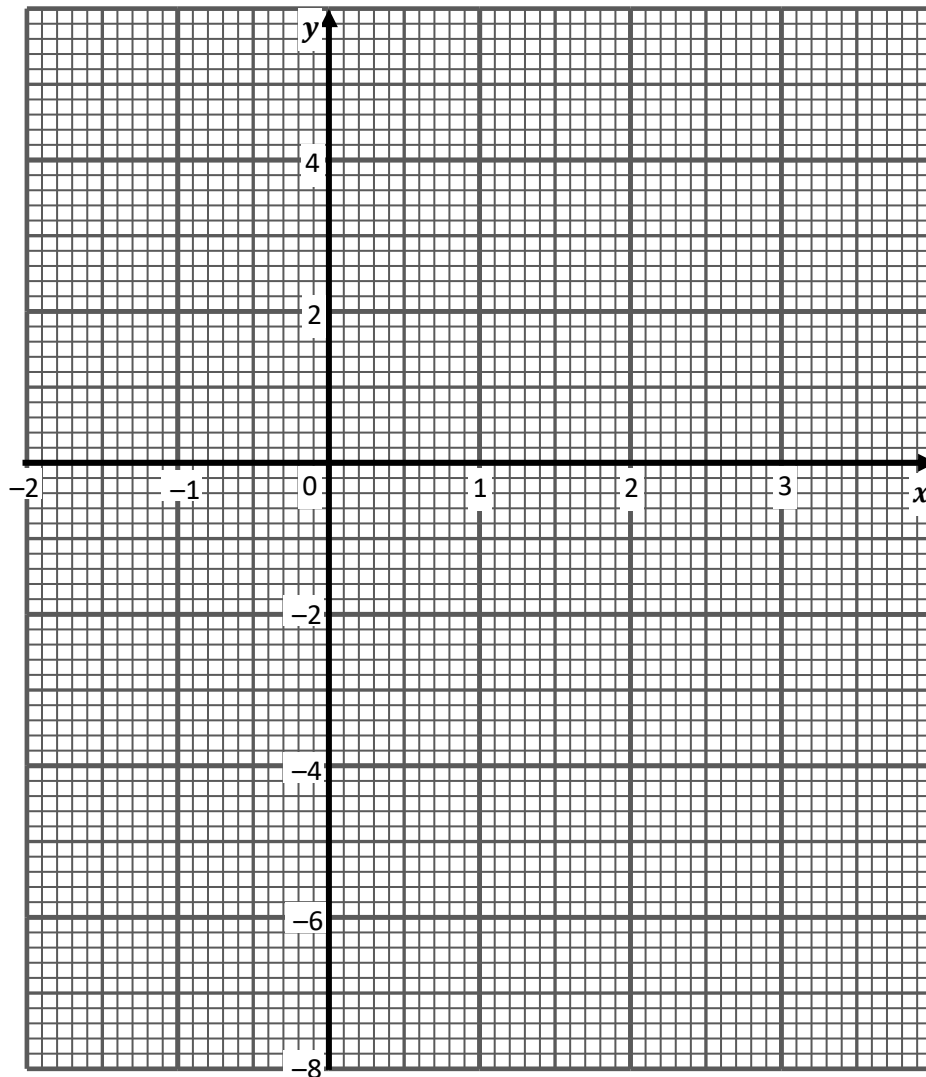
Ans: _____ cm²

(6 marks)

9. a) Fill in the table below for the straight line graph $y = 3x - 2$.

x	- 2	- 1	0	1	2
$3x$			0		6
- 2			- 2		- 2
y			- 2		4

b) Draw the graph on the grid below.



c) Does the point (4, 6) lie on the line $y = 3x - 2$?

Working: _____

Circle the correct answer. Yes / No

d) Underline the equation of the line that is parallel to the line $y = 3x - 2$.

$y = 5x - 2$

$y = x + 3$

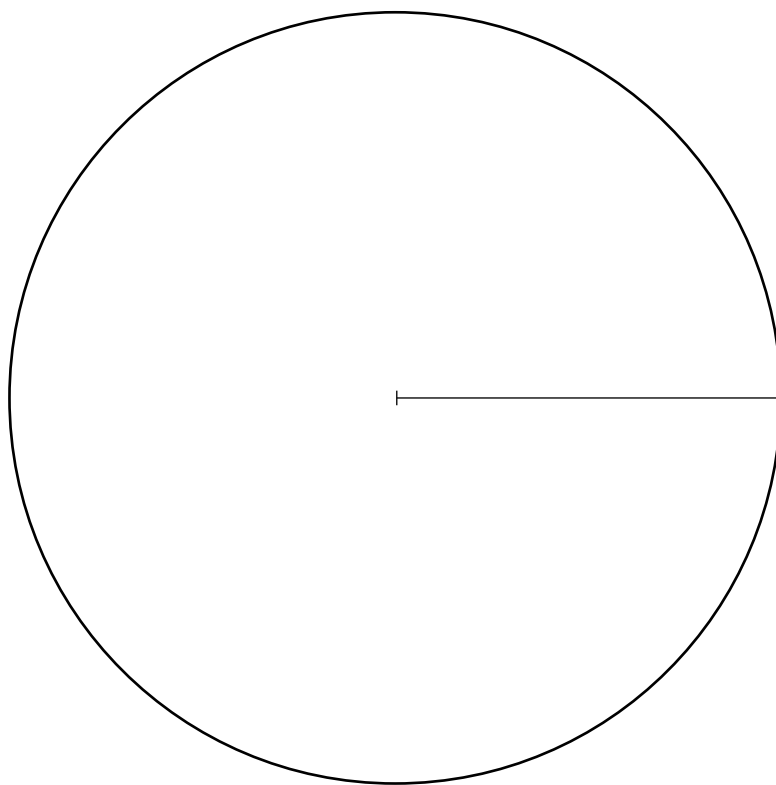
$y = 3x + 5$

(7 marks)

10. In a survey, some students were asked what they prefer to eat for breakfast. The results are shown in the table below.

Breakfast type	Frequency (f)
Cereal	26
Sandwich	13
Eggs	10
Fruit	35
Sweets	6

- a) Construct a pie chart to represent the information in the table above.

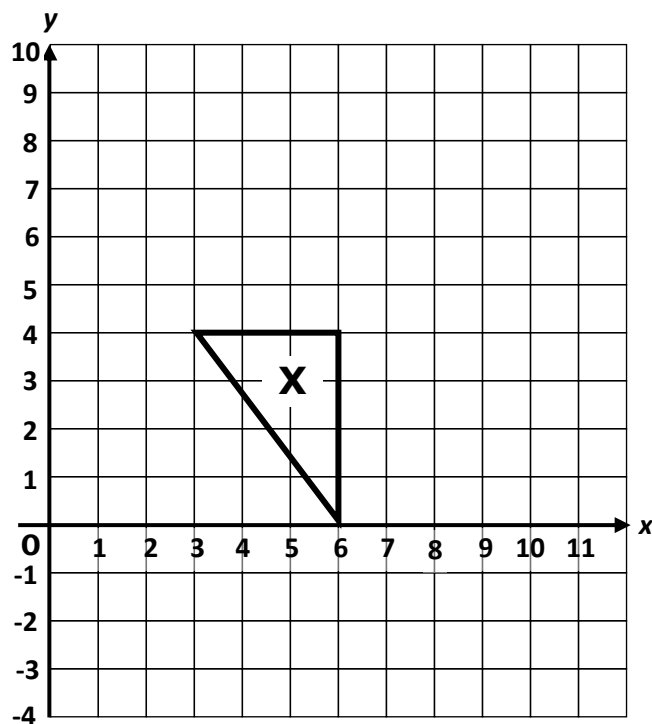


- b) Express the total number of students who prefer eggs and fruit as a percentage of all the students surveyed.

Ans: _____ %

(6 marks)

11.

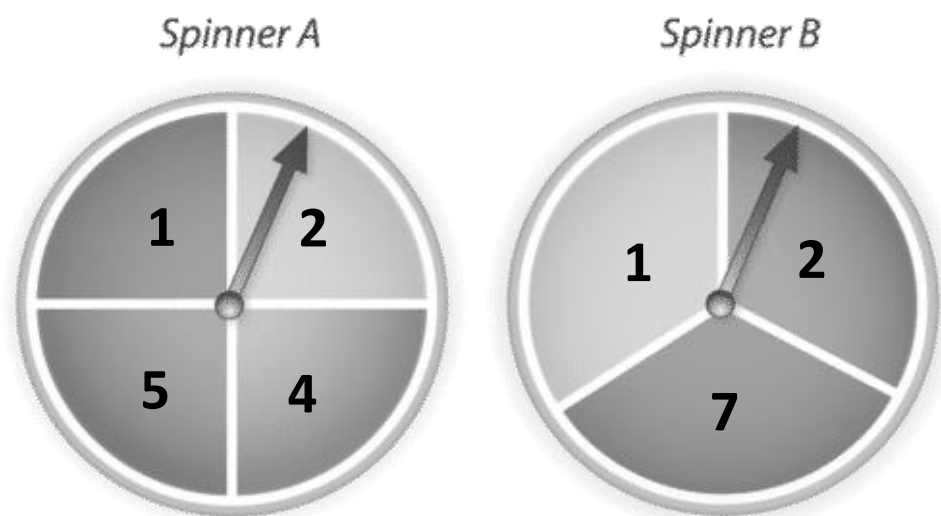


- a) Triangle X is translated by $\begin{pmatrix} -3 \\ 5 \end{pmatrix}$ to form triangle A. Draw triangle A.
- b) Describe the transformation that maps triangle A to triangle X.

- c) Triangle X is rotated by 90° clockwise about the point $(6, 0)$ to form triangle B. Draw triangle B.
- d) Triangle X is reflected in the x -axis to form triangle C. Draw triangle C.
- e) Triangle X is reflected in the line $x = 3$ to form triangle D. Draw triangle D.

(6 marks)

12. Liam writes down all the possible outcomes of spinning two spinners together and lists the outcomes in a possibility space.



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

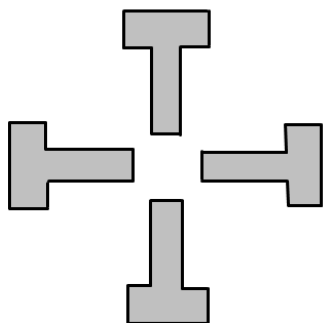
		Spinner B		
		1	2	7
Spinner A	1	(1 , 1)	(1 , 2)	(1 , 7)
	2			
	4			
	5			

- b) Find the probability that:

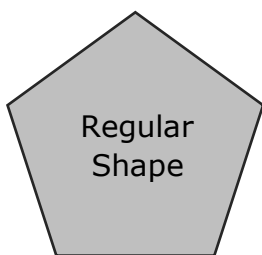
- i) Both spinners show the same number. _____
- ii) The numbers on both spinners are odd. _____
- iii) The total of the numbers on both spinners is less than 5. _____
- iv) The total is more than 10. _____
- v) The total is more than 20. _____

(8 marks)

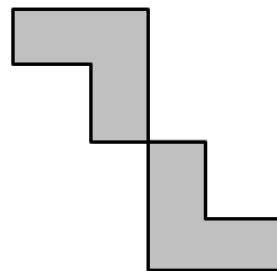
13. a) Write down the order of rotational symmetry of the designs below.



Order _____

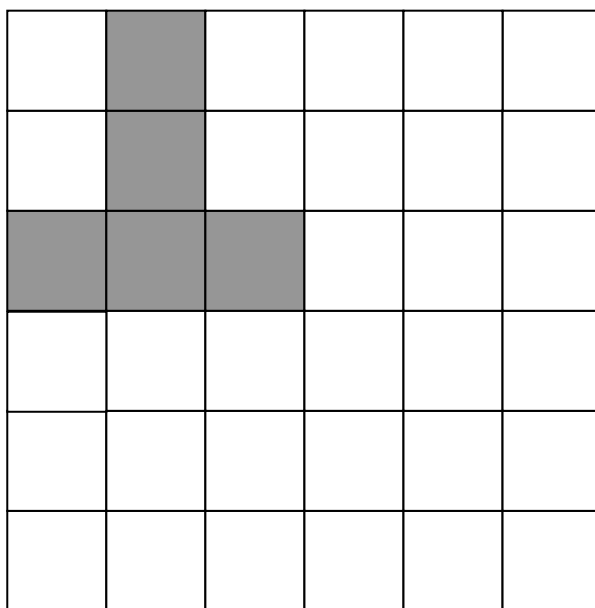


Order _____



Order _____

b) Complete the shading inside the diagram below so that the resulting shape has a rotational symmetry of order 2.



(4 marks)

End of Examination