



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	14	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. The temperature in London yesterday was -5°C . Today it is 1°C .

a) Is the temperature today colder or warmer than yesterday? Ans: _____

b) By how much did the temperature change? Ans: _____ $^{\circ}\text{C}$

The temperature in Malta today is 35°C .

c) What is the difference in temperature between Malta and London **today**?

Ans: _____ $^{\circ}\text{C}$

The temperature in Moscow today is -11°C

d) What is the difference in temperature between London and Moscow **today**?

Ans: _____ $^{\circ}\text{C}$

(4 marks)

2.

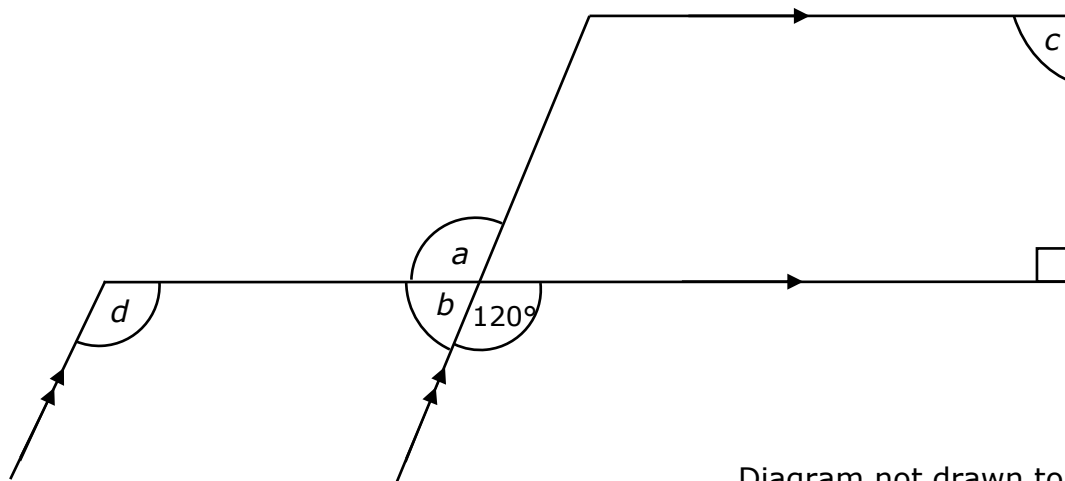


Diagram not drawn to scale

Work out the angles marked with letters. Give a reason for your answer.

$a =$ _____ Reason: _____

$b =$ _____ Reason: _____

$c =$ _____ Reason: _____

$d =$ _____ Reason: _____

(7 marks)

3. The shape below is made up of a square of side 3.5 cm and four identical triangles. The height of each triangle is 4 cm.

Calculate:

- a) the area of the square.

Ans: _____ cm^2

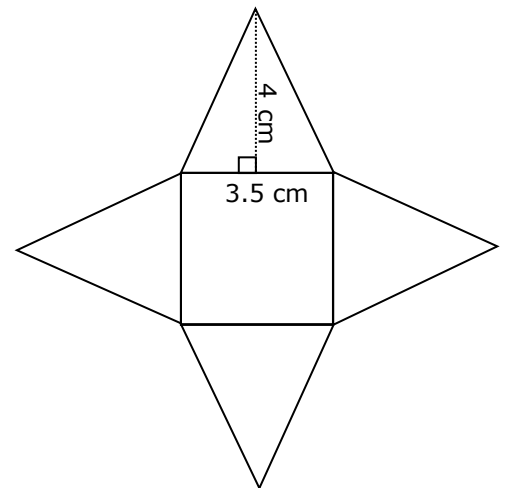


Diagram is not drawn to scale

- b) the area of one of the triangles.

Ans: _____ cm^2

- c) the total area of this shape.

Ans: _____ cm^2

(6 marks)

4. Shiny washing powder comes in two sizes.

The 500 g packet in the diagram is the smaller size.

The larger packet holds 85% more than the smaller one.

a) How much washing powder does the larger packet hold?



Ans: _____ g

b) The smaller packet costs €3.60. There are two offers on the smaller packet of Shiny washing powder.

Offer A 2 packets for €7.00

Offer B 3 packets for €10.65

Underline the correct answer and explain your reasoning.

Ans: (Offer A, Offer B) gives the better value for money because

(6 marks)

5. a) Using ruler and compasses only, construct triangle QRS such that
RS = 7 cm, QR = 6 cm and QS = 5 cm. Point R has been marked for you.

R +

- b) Construct a regular hexagon of side 4 cm.

(5 marks)

6. a) Write 168 as a product of prime factors in index form.

Ans: 168 = _____

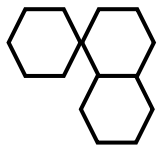
- b) Find the least common multiple of 18, 15 and 9.

Ans: LCM = _____

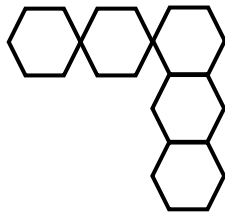
(4 marks)

7. The diagram below shows patterns made up of hexagons.

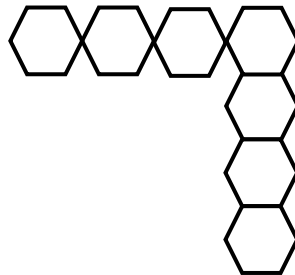
Pattern 1



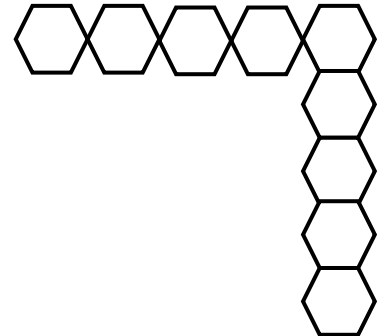
Pattern 2



Pattern 3



Pattern 4



a) Fill in this table:

Pattern Number	1	2	3	4		7
Number of Hexagons	3					

b) Underline the correct answer.

The number of hexagons in each pattern above is (even, odd, prime).

(4 marks)

8. Marco is a baker. He bakes 420 cakes.

The flavours of these cakes are vanilla, chocolate, strawberry and lemon.

a) $\frac{2}{7}$ of the cakes are vanilla cakes. Find the number of vanilla cakes Marco bakes.

Ans: _____ vanilla cakes

b) 35% of the cakes are strawberry cakes. Find the number of strawberry cakes that Marco bakes.

Ans: _____ strawberry cakes

c) The ratio of the number of lemon cakes to the number of chocolate cakes is 4: 5. Find the number of lemon cakes and the number of chocolate cakes that he bakes.

Ans: _____ lemon cakes

Ans: _____ chocolate cakes

(7 marks)

9. a) Sandra counts the number of people in cars passing through her street.

Here is the data she collected:

3 , 4 , 4 , 1 , 2 , 2 , 1 , 1 , 3 , 2 , 1 , 1 , 2 , 5 , 4

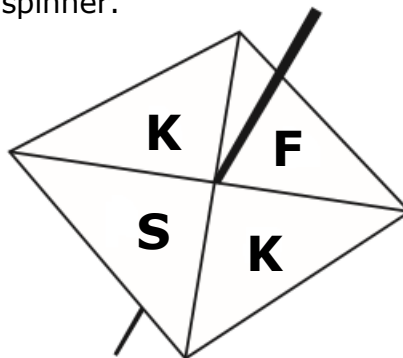
Find the mode, median and range of this set of data.

Ans: mode = _____

median = _____

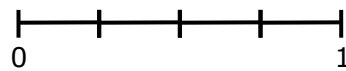
range = _____

- b) Jacob spins a fair four-sided spinner.

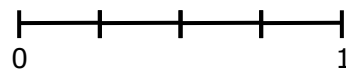


On the probability scale, mark with an (X) the probability that the spinner will land on:

- i) letter K



- ii) letter A



(5 marks)

10. a) Daniel is organising a barbecue.

He uses the formula below to work out the number of burgers he needs to buy.

Number of burgers = Multiply the number of people by 2 and add 8

How many burgers should Daniel buy if 23 people are coming to the barbecue?

Ans: _____ burgers

b) Daniel has a piece of beef weighing 5 kg.

He uses this formula to work out the time it takes to cook the beef.

$$T = 30w + 20$$

T = time in minutes, w = weight in kilograms

How long should Daniel cook the beef?

Ans: _____ minutes

c) The grill of Daniel's barbecue is rectangular.



Diagram not drawn to scale

Write a formula for the perimeter, P , of the grill in terms of x and y .
Simplify your answer.

Ans: $P =$ _____

(6 marks)

11. a) (i) Simplify: $6a + 5b + 3a - 2b$

Ans: _____

(ii) Expand:

$5(x + 4) =$ _____

b) (i) Solve: $2(k - 3) = 26$

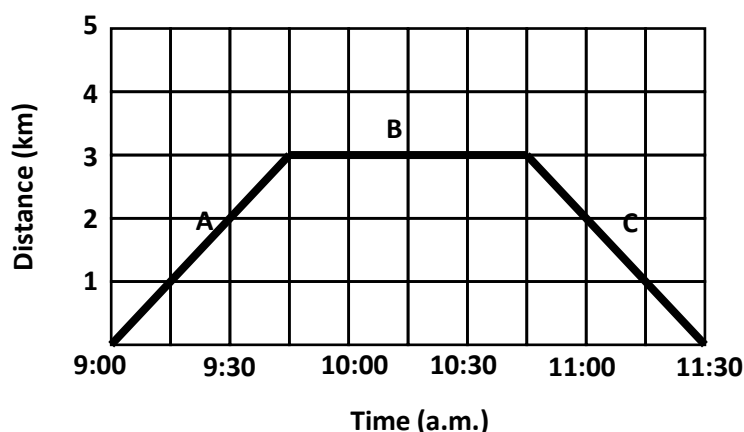
Ans: $k =$ _____

(ii) Solve: $\frac{x}{3} = 11$

Ans: $x =$ _____

(5 marks)

12. Every Sunday, Maya cycles to her grandmother's house. She spends some time with her grandmother and then returns home. This is a distance-time graph that represents Maya's journey with her bicycle.



a) At what time does Maya leave home? _____

b) How long does she stay at her grandma's house? _____

c) At what time does she arrive home? _____

d) What does line A and line C in the graph above represent?

Line A $\Rightarrow$ _____

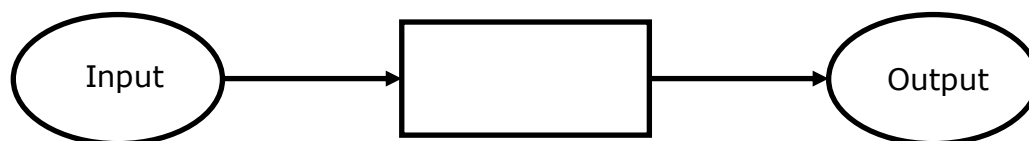
Line C $\Rightarrow$ _____

(5 marks)

13. Robert is working with a number machine. Here are some inputs and outputs of this machine.

INPUT	OUTPUT
7	6
3	2
- 3	- 4
5	
	0
- 1	

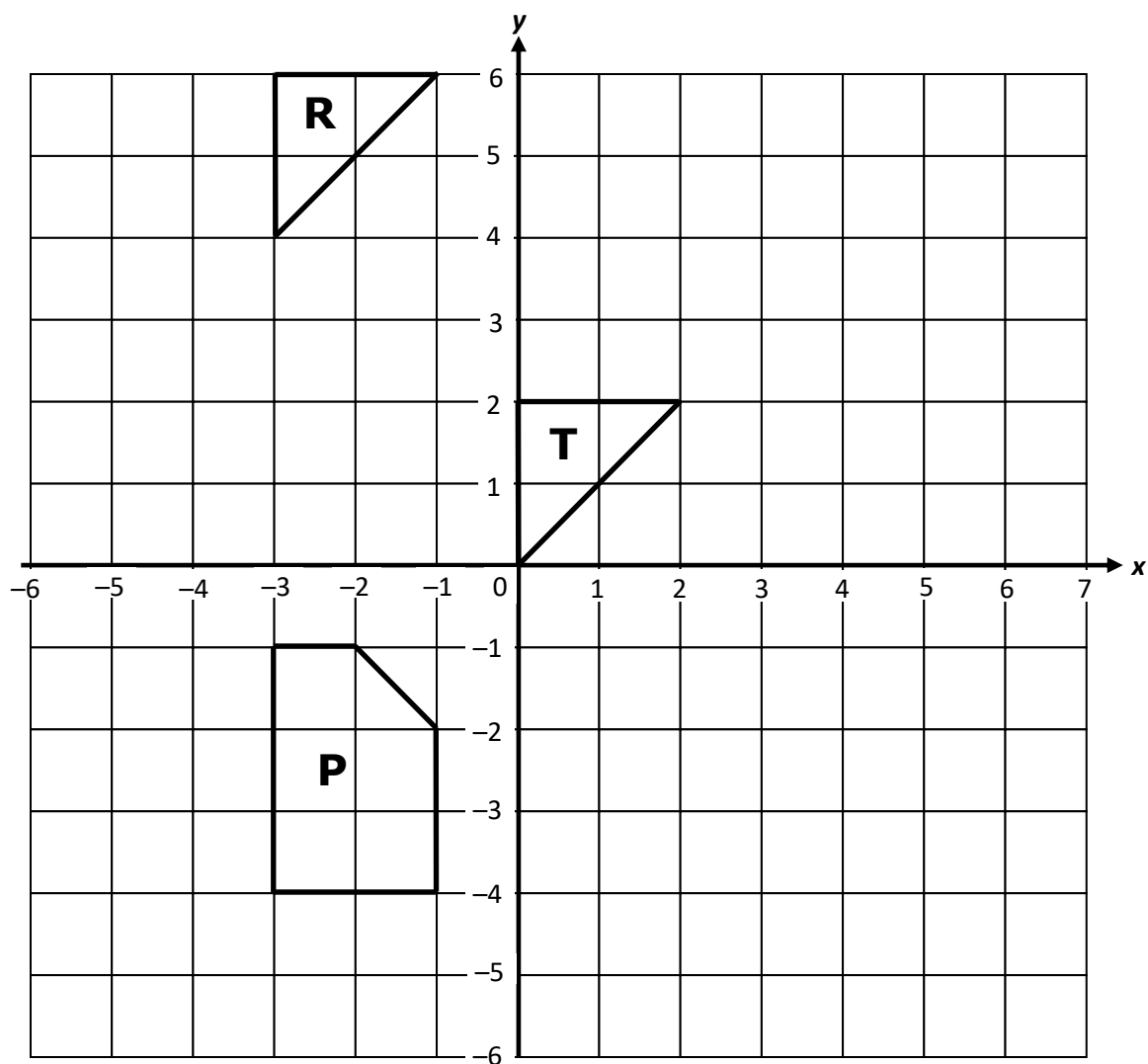
- a) Fill in the blanks to complete the table above.
- b) Use the information in the table to complete the number machine below:



- c) If the input is 200, what is the value of the output? Output = _____
- d) If the output is 473, what is the value of the input? Input = _____

(5 marks)

14.



a) Fill in the blanks.

The transformation mapping R to T is a _____

by column vector _____ .

b) Reflect shape P in the line $x = 1$ to form shape Q. Draw shape Q.

c) Rotate triangle T by 90° clockwise about $(0,0)$ to form shape S. Draw shape S.

(6 marks)

End of Examination