Index No _____

GOVERNMENT OF MALTA
MINISTRY FOR EDUCATION, SPORT, YOUTH
RESEARCH AND INNOVATION
DEPARTMENT OF EXAMINATIONS

Qualifying Examination for Supply Learning Support Educators

April 2023

Subject: **Mathematics**

Time: **(One hour and thirty minutes)**

Instructions to candidates:

- Answer ALL questions.
- Write your answers in the space available on the examination paper.
- Show clearly all the necessary steps, explanations and construction lines in your working.
- Unless otherwise stated, diagrams are drawn to scale.
- The use of non-programmable scientific calculators with statistical functions and of mathematical instruments is allowed.
- Candidates are allowed to use transparencies for drawing transformations.
- This paper carries a total of 100 marks

Question No.	1	2	3	4	5	6	7	8	9	10
Mark										

Question No.	11	12	13	14	15	16
Mark						

Total

1. Fill in to complete the statements below.

(a) 0.25 hour = _____ minutes

(b) 1.5 litre = _____ cm^3

(c) $\frac{3}{4}$ kg = _____ grams

(d) 210 minutes = _____ hours

(e) 850 m = _____ km

(5 marks)

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2. (a) Complete the following sequences:

(i) 7.75 , 8.50 , 9.25 , _____ , _____

(ii) $2\frac{1}{4}$, $2\frac{3}{4}$, $3\frac{1}{4}$, _____ , _____

(iii) 3 , –2 , –7 , _____ , _____

(b) Use your calculator to find the value of $\frac{\sqrt{16.5^2 + 9.1}}{3.5}$.
Give your answer correct to one decimal place.

Ans: _____

(5 marks)

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3. The following are the ages of six cousins: 25, 27, 43, 32, 39, 20.

Work out:

(a) the mean;

Ans: _____

(b) the median;

Ans: _____

(c) the range.

Ans: _____

(7 marks)

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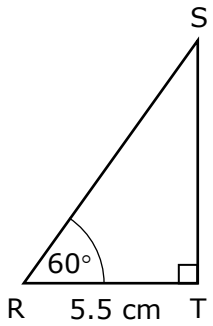
4. *In this question use ruler and compasses*.

(a) Construct triangle RST shown in the adjacent sketch.



R

(b) Measure the length of ST on your construction.

Ans: ST = _____

(5 marks)

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5. (a) Simplify: $\frac{2y^3 \times 6y^2}{4y}$

Ans: _____

(b) Expand and simplify: $3(2x - 1) + 4(x + 5)$

Ans: _____

(4 marks)

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6. Zea and Paul invest €3500 and €5500 respectively.

(a) Write these amounts as a ratio in its simplest form.

Ans: _____

(b) Together they earn €720 interest.

(i) How much interest did each of them earn?

Ans: Zea _____, Paul _____

(ii) Zea and Paul pay 15% taxes on the interest earned.
Calculate the amount of tax paid by Zea and Paul altogether.

Ans: _____

(8 marks)

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7. (a) Factorise completely: $4pq^2 + 10p^2$

Ans: _____

(b) Given that $f(x) = 3x + 8$, evaluate $f(7)$.

Ans: _____

(4 marks)

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8. (a) Faith wants to buy a car. She pays a deposit of €3000 followed by 18 monthly payments of €320 each.
Work out the total amount that Faith paid for the car.

Ans: _____

(b) Luke wants to buy a set of headphones.
Which shop offers the cheaper discounted price? Show your working.

Shop A
Price €60
$\frac{1}{4}$ off

Shop B
Price €62
30% Discount

Ans: _____

(8 marks)

9. A lamppost, PQ, is 3.3 m high. The angle of elevation of the top of the lamppost from a point R on the ground is 31°. Calculate the distance of R from Q.

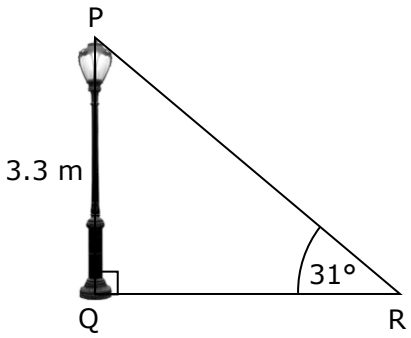
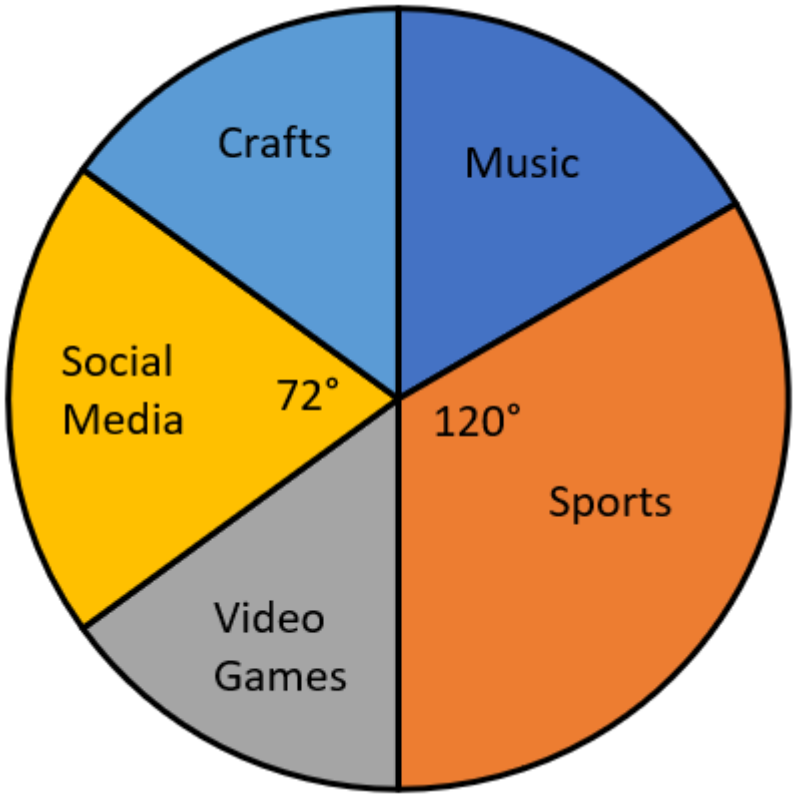


Diagram not drawn to scale

Ans: _____

(3 marks)

10. The pie chart below shows the preferred hobbies of a group of teenage students.



(a) Which two hobbies are equally popular?

Ans: _____ , _____

(b) Twenty-four students prefer Social Media.
How many students prefer sports?

Ans: _____

(c) One of these students is chosen at random.
What is the probability that the student prefers Music?

Ans: _____

(4 marks)

11. The diagram shows circle ABCDE, centre O.
ED is parallel to AC and BE is parallel to CD.

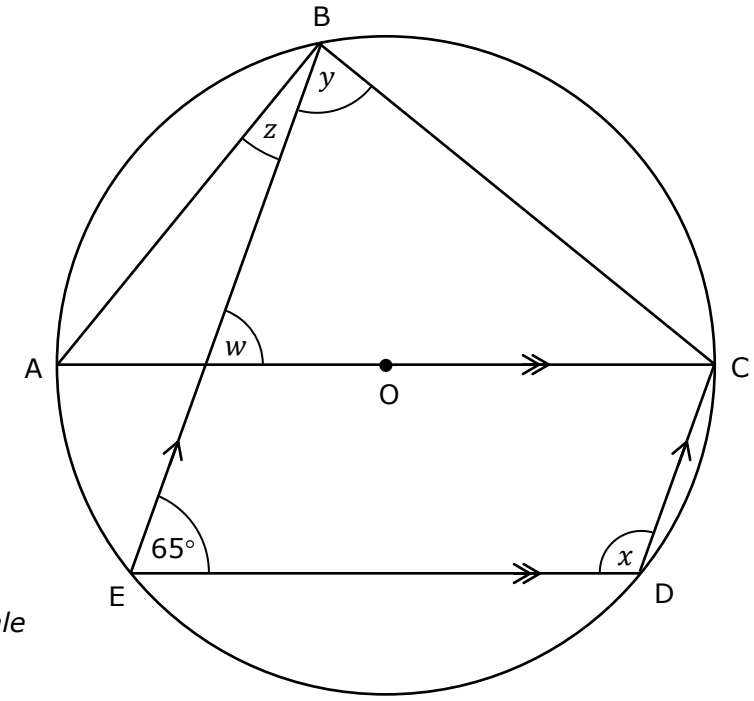


Diagram not drawn to scale

Find the size of the following angles, giving reasons for your answers:

(a) Angle w:

Ans: _____ Reason:_____

(b) Angle x:

Ans: _____ Reason:_____

(c) Angle y:

Ans: _____ Reason:_____

(d) Angle z:

Ans: _____ Reason:_____

(8 marks)

12. The first few terms of a sequence of numbers is shown below:

20, 17, 14, 11, 8, …

(a) Find an expression for the n^{th} term of this sequence.

Ans: _____

(b) Calculate the 99^{th} term of this sequence.

Ans: _____

(c) Show that −101 is not a term in this sequence.

(7 marks)

13. A can of paint costs p euro, and a paint brush costs b euro.
The cost of 5 cans of paint and 3 paint brushes is €128.
The cost of 7 cans of paint and 1 paint brush is €168.

(a) Form two equations in terms of p and b.

Ans: Equation (i) _____

Equation (ii) _____

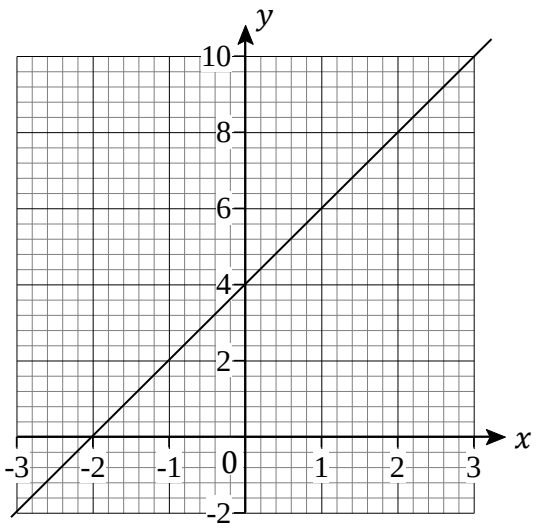
(b) Solve your equations (i) and (ii) simultaneously to find the cost of a can of paint and the cost of a paint brush.

Ans: Can of paint: _____

Paint brush: _____

(7 marks)

14. Look at the straight-line graph below.



(a) Complete this table of values for the line.

x	-3	0	1	3
y		4		

(b) Calculate the gradient of the line.

Ans: _____

(c) Which of the equations below is the equation of the straight line?

(A) $x + 2y = -4$ (B) $y - 2x = 4$ (C) $2x + y = 4$ (D) $2x - y = 4$

Ans: _____

(d) What is the value of y when $x = 14$?

Ans: _____

(8 marks)

15. The diagram below shows a company logo consisting of three shapes: a semicircle, a trapezium and a triangle.

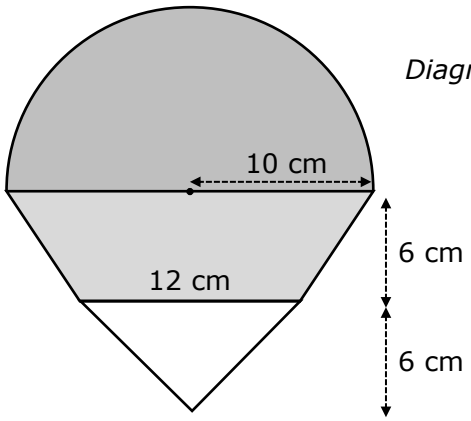


Diagram not drawn to scale

(a) Calculate the area of the semi-circular part of the logo.

Ans: _____

(b) Calculate the total area of the logo.

Ans: _____

(9 marks)

16. The diagram below shows quadrilateral PQRS.

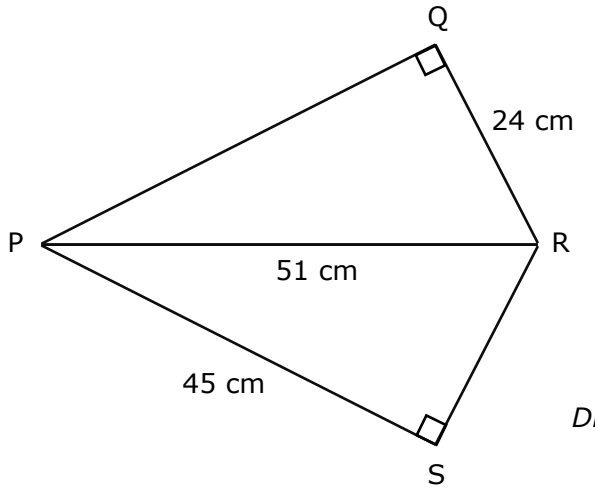


Diagram not drawn to scale

(a) Calculate the length of PQ.

Ans: _____

(b) Show that triangles PQR and PSR are congruent. Give reasons.

(c) What is the length of RS?

Ans: _____

(8 marks)

End of Paper