



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

Qualifying Examination for Supply Learning Support Educators

April 2024

Subject: Mathematics
Date: Friday 12th April 2024
Time: One hour and thirty minutes

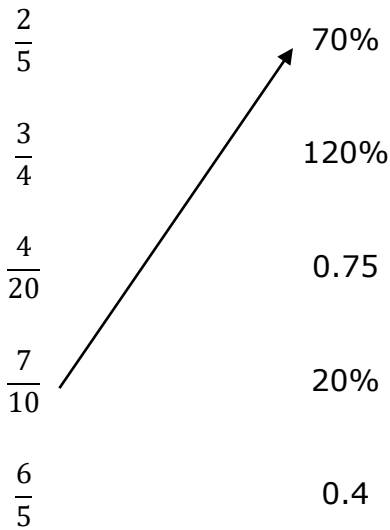
Instructions to candidates:

- 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	17	18	Total
Mark									

1. Match with an arrow the fractions on the left with those on the right.



(4 marks)

2. (a) The formula $F = \frac{9C}{5} + 32$ is used to change degrees Celsius (C) to degrees Fahrenheit (F). Use this formula to change -10°C to Fahrenheit.

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

(b) Open the brackets and simplify.

$$3(a - 2) - 4(2a - 3)$$

Ans: _____

(5 marks)

3. (a) Work out the value of a and b .

(i) $\left(\frac{3}{4}\right)^a = 1$

(ii) $b^3 + 5^2 = 33$

$a =$ _____

$b =$ _____

(b) Work out, showing your working.

$$\left(\frac{3}{4} - \frac{3}{8}\right) \times \frac{4}{9}$$

Ans: _____
(5 marks)

4. (a) Solve: $5(2x - 1) = 13$

Ans: $x =$ _____

(b) The length of a rectangle is 5 cm longer than its width. The perimeter of the rectangle is 40 cm. The width of the rectangle is w cm long.

(i) Form an equation for the perimeter in terms of w .

Ans: _____

(ii) Solve this equation to find the length and width of the rectangle.

Ans: Length = _____ cm, Width = _____ cm
(7 marks)

5. (a) Simplify: $1.2 : 3.6 : 9.6$

Ans: _____

(continued on the next page)

5. (b) The ratio of a map is 1 : 50 000. On the map, the distance between two towns is 3.6 cm. Work out the actual distance, in kilometres.

Ans: _____ km
(5 marks)

6. (a) Lines AC, DF and GH are parallel. $\angle BGH = 74^\circ$ and $\angle BEF = 129^\circ$.

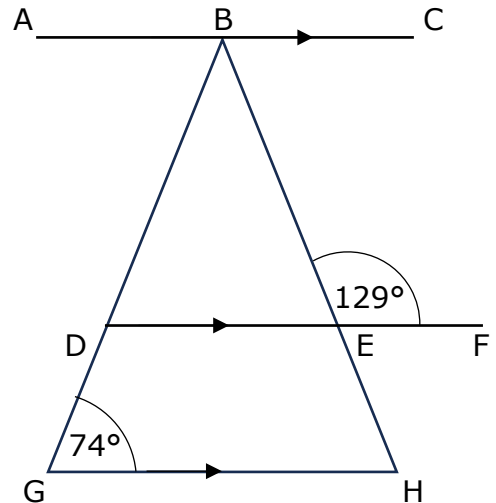
Work out the size of:

- (i) $\angle GHE$

Ans: $\angle GHE =$ _____ $^\circ$

- (ii) $\angle DBE$

Ans: $\angle DBE =$ _____ $^\circ$



- (b) The diagram (right) shows two regular decagons joined together.

- (i) Work out the size of one of the interior angles of a regular decagon.

Ans: _____ $^\circ$

- (ii) Work out the size of the angle marked y .

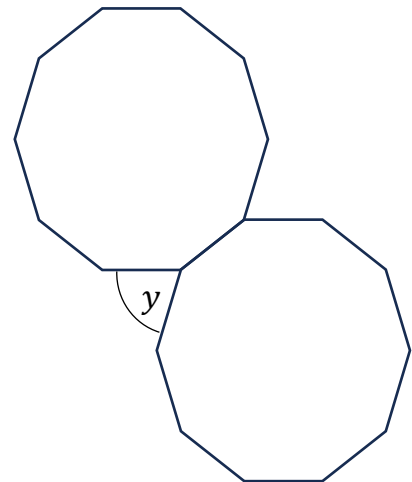
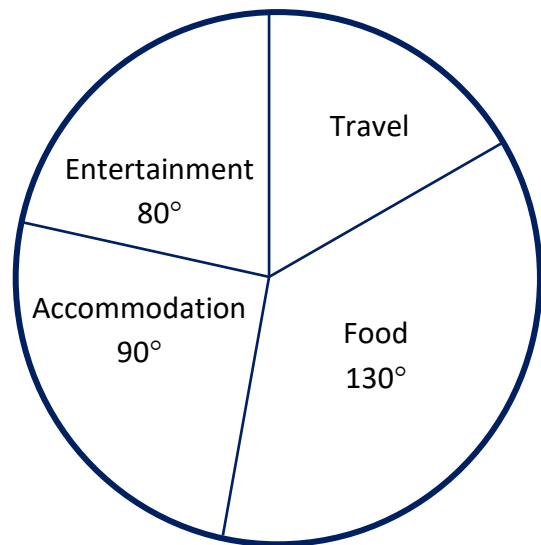


Diagram not drawn to scale

Ans: $y =$ _____

(6 marks)

7. The pie chart shows the costs incurred by a tourist during a holiday. The total amount spent was of €600.



- (i) How much money was spent on accommodation?

Ans: € _____

- (ii) How much money was spent on travel?

Ans: € _____

(6 marks)

-
8. (a) Factorise completely.

$$2x^3 - 4x^2 + 6x$$

Ans: _____

- (b) Four students solved the two simultaneous equations below and obtained different answers.

$$\begin{aligned} 2x - y &= 2 \\ x + y &= -5 \end{aligned}$$

Their answers are given below.
Underline the correct answer.

A: $x = 1, y = 4$ B: $x = -1, y = -4$ C: $x = -1, y = 4$ D: $x = 1, y = -4$

(4 marks)

9. The figure below shows two triangles DEF and PQR, such that $\angle EDF = \angle QPR$ and $\angle DEF = \angle PQR$.

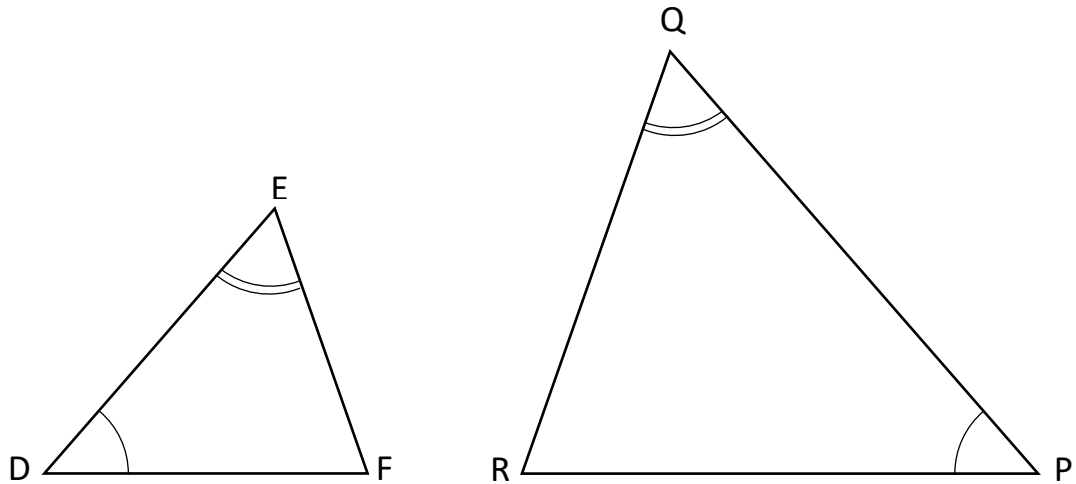


Diagram not drawn to scale

- (i) Explain why the triangles DEF and PQR are similar.

- (ii) In triangle DEF, $DE = 20$ cm and $EF = 15$ cm. In triangle PQR, $PQ = 70$ cm. Work out the length of QR.

Ans: QR = _____ cm

(5 marks)

10. O is the centre of the circle. Work out the value of the angles x and y , giving reasons for your answers.

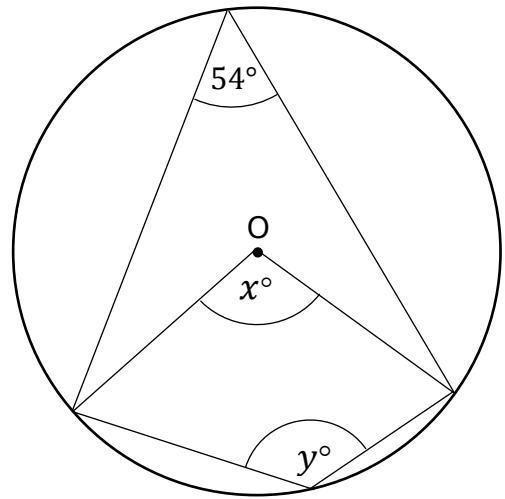


Diagram not drawn to scale

$x =$ _____

Reason: _____

$y =$ _____

Reason: _____

(4 marks)

11. (a) Mandy works 30 hours a week and earns €16 per hour.

- (i) How much does Mandy earn in one year?

Ans: € _____

- (ii) Mandy pays 15% tax. How much tax does Mandy pay in one year?

Ans: € _____

- (b) Mandy invests €3500 at 2.5% simple interest rate for 5 years.
How much interest does Mandy earn?

Ans: € _____

(6 marks)

12. (a) (i) Write down the next two terms of the sequence below.

5, 8, 11, 14,

Ans: _____ and _____

(ii) Underline the n th term of this sequence.

A: $3n - 2$

B: $2n + 3$

C: $3n + 2$

D: $2n - 3$

(b) (i) The n th term of another sequence is $3n - 5$. Work out the fifth term.

Ans: _____

(ii) The last term in the sequence is 175. How many terms are in the sequence?

Ans: _____

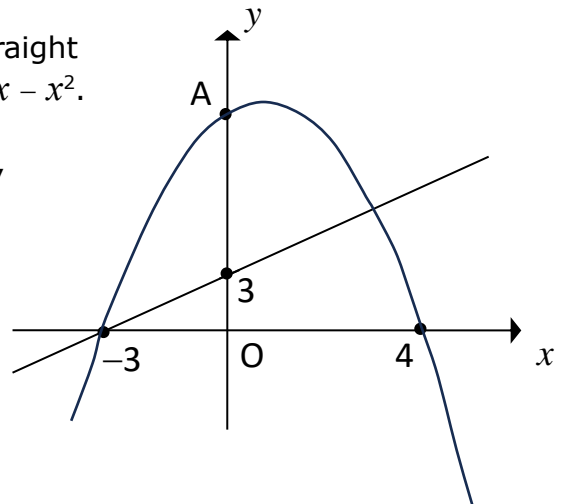
(6 marks)

13. The diagram below shows a curve and a straight line. The equation of the curve is $y = 12 - x - x^2$.

(i) Write down the coordinates of point A, where the curve cuts the y -axis.

A (_____, _____)

(ii) Work out the gradient of the straight line.



Gradient = _____

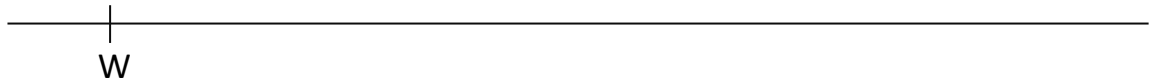
(iii) Write down the equation of the straight line.

Ans: _____

(6 marks)

14. For this question use ruler and compasses only.

(a) Construct triangle WXY where $WX = 9 \text{ cm}$, $\angle XWY = 90^\circ$ and $WY = 7.5 \text{ cm}$.



(b) Construct the bisector of angle $\angle WXY$.

(c) Work out the area of triangle WXY.

Ans: _____

(7 marks)

15. The formula $V = \frac{\pi r^2 h}{3}$ is used to find the volume, V , of a cone having base radius r and height h .

(i) Make r the subject of this formula.

Ans: $r =$ _____

(ii) The volume of a cone is 310 cm^3 and its height is 10.2 cm . Work out the length of the radius of the cone, giving your answer correct to 3 significant figures.

Ans: $r =$ _____ cm

(6 marks)

16. (a) Six youths sat for a driving test.

The points that each of these six youths scored are 8, 10, 12, 16, 6, 8.

Work out:

- (i) the mode
- (ii) the range
- (iii) the median.

Mode = _____ Range = _____ Median = _____

(b) Another youth sat for the driving test. The mean of the 7 youths was 11. Work out the score of the seventh youth.

Ans: _____ points

(6 marks)

17. A small aeroplane, P, is flying vertically above a harbour, H, at an altitude of 1200 metres. Two ships, X and Y, are in the vicinity of the harbour.

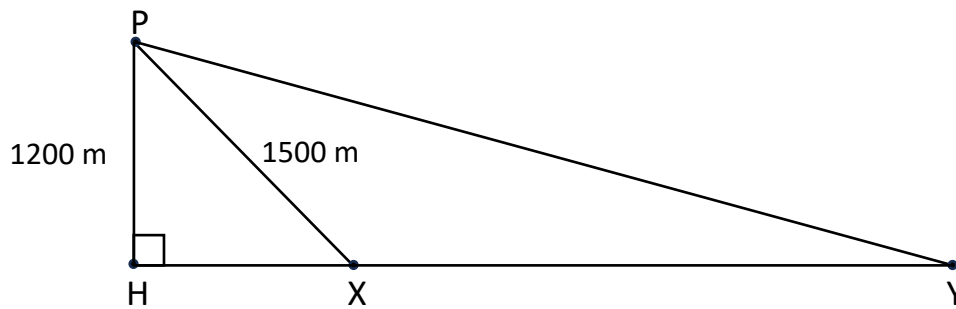


Diagram not drawn to scale

- (i) The distance between P and X is 1500 m. Work out the distance of ship X, from the harbour, H.

Ans: $HX =$ _____ metres

- (ii) Work out the size of $\angle HXP$. Give your answer correct to the nearest degree.

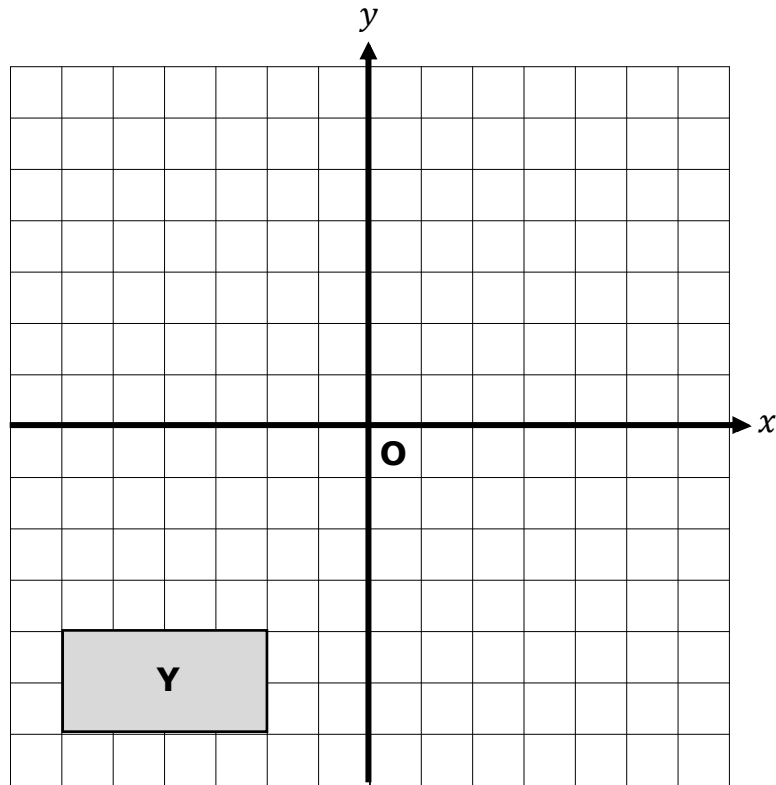
Ans: $\angle HXP =$ _____ $^\circ$

- (iii) Given that $\angle PYH = 16^\circ$, calculate the distance, XY, between the two ships.

Ans: $XY =$ _____ metres

(7 marks)

18.



On the grid above:

- (i) Draw a reflection of rectangle Y in the x -axis. Label the image as A.
- (ii) Translate rectangle Y by $\begin{pmatrix} 5 \\ 6 \end{pmatrix}$. Label the image as B.
- (iii) Draw a rotation of rectangle Y by 90° anticlockwise about O. Label the image as C.

(5 marks)

End of Paper