



GAUTENG PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

NOVEMBER 2023

GRADE 10

MATHEMATICS

PAPER 2

TIME: 2 hours

MARKS: 100

9 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of NINE questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs, etc. which were used in determining the answers.
4. Answers only will NOT necessarily be awarded full marks.
5. Use an approved scientific calculator (non-programmable and non-graphical), unless otherwise stated.
6. Where necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Number the questions correctly according to the numbering system used in this question paper.
9. Write neatly and legibly.

QUESTION 1

The maximum temperature (in degrees celcius) at 20 tourist resort centres were measured and recorded. The results were recored in the table below.

22	23	24	25	26	28	29	29	30	32
32	33	34	35	36	37	37	38	39	40

- 1.1 Write down the median temperature measured. (1)
 - 1.2 Determine:
 - 1.2.1 The mean temperature (2)
 - 1.2.2 The range (1)
 - 1.2.3 The interquartile range (3)
 - 1.3 Draw a box and whisker diagram to represent the data above. (2)
 - 1.4 The tourism sector claims that 20% of the resort centres recorded temperatures too hot for tourist activities. Determine the minimum recorded temperature that satisfies the above claim. (2)
- [11]**

QUESTION 2

A supermarket sells light bulbs. The store keeps a record of the wattage of the light bulbs that they sold in the month of October 2023. The monthly sales are summarised in the table below.

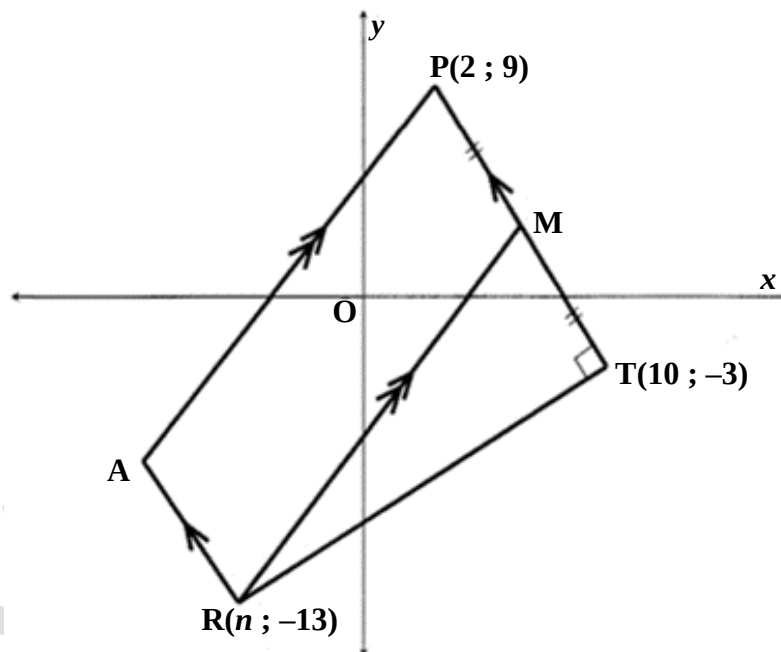
Wattage Interval	Frequency
$80 \leq x < 95$	3
$95 \leq x < 110$	17
$110 \leq x < 125$	31
$125 \leq x < 140$	16
$140 \leq x < 155$	10

- 2.1 How many light bulbs were sold in the month of October? (1)
- 2.2 Write down the modal class of the data above. (1)
- 2.3 Determine the interval in which the median lies. (2)

- 2.4 Express the number of light bulbs with the most popular wattage as a percentage of the October sales. (2)
- 2.5 Estimate the mean wattage of the light bulbs that were sold. (3)
- 2.6 The manager of the store decided to display the data collected on a pie chart. Calculate the size of the largest angle of the pie chart. (2)
- [11]**

QUESTION 3

In the diagram below, P (2;9), A, R(n ; -13) and M are vertices of parallelogram PARM. PMT is a straight line such that M is the midpoint of PT. T (10; -3) is a point such that $PT \perp RT$.



- 3.1 Determine:
- 3.1.1 The length of PT (Leave your answer in surd form.) (2)
- 3.1.2 The gradient of PT (2)
- 3.1.3 The gradient of AR (1)
- 3.1.4 The coordinates of M (3)
- 3.2 Determine the equation of PM in the form $y = mx + c$. (3)

3.3 Show that $n = 5$. (3)

3.4 Calculate the area of $\triangle RMT$. (4)
[18]

QUESTION 4

4.1 Use a calculator to find the values of the following, correct to two decimal places.

4.1.1 $4\sin 65^\circ$ (1)

4.1.2 $\frac{\cos^2(32^\circ - 10^\circ)}{\tan 22^\circ}$ (2)

4.2 Calculate θ where $0^\circ \leq \theta \leq 90^\circ$.

$3\sin\left(\frac{\theta}{2} - 20^\circ\right) = 0,85$ (4)

4.3 **Without the use of a calculator**, determine the value of:

$\frac{\cos 45^\circ}{\sin 45^\circ} + 5\operatorname{cosec} 90^\circ \times 3\tan^2 30^\circ$ (4)
[11]

QUESTION 5

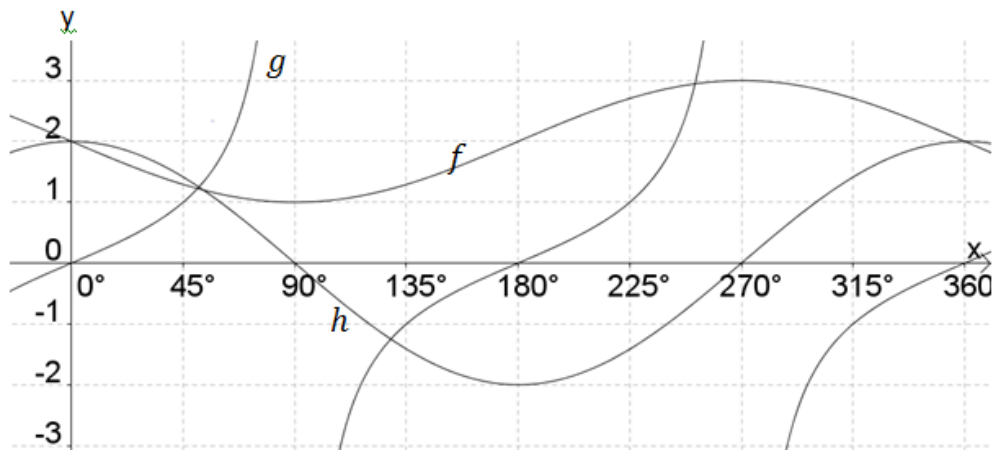
If $5\cos \beta = -3$ and $180^\circ \leq \beta \leq 360^\circ$, **with the use of a diagram**, calculate the value of the following: **(Do NOT calculate the value of β .)**

5.1 $\cos \beta$ (3)

5.2 $\tan^2 \beta - \cot^2 \beta$ (2)
[5]

QUESTION 6

The graphs of $f(x) = a \sin x + q$, $h(x) = p \cos x$ and $g(x) = \tan x$ for $x \in [0^\circ ; 360^\circ]$ are drawn below.

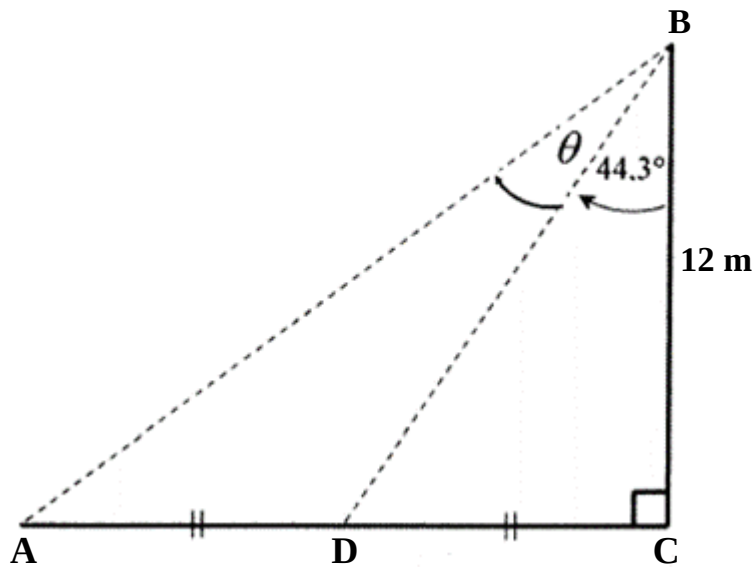


- 6.1 Determine the values a , p and q . (3)
- 6.2 For which values of x is $h(x) \leq 0$ for $x \in [0 ; 360]$? (2)
- 6.3 Determine for which value(s) of x will $f(x) = h(x)$. (3)
- 6.4 Write down the range of f . (2)
- [10]**

QUESTION 7

The diagram below shows a spotlight at point B, which is mounted 12 m directly above point C at the front of the field.

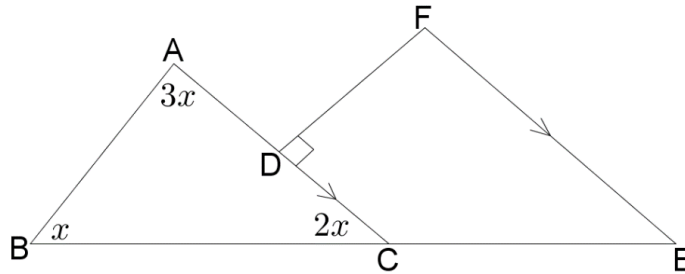
The spotlight swings $44,3^\circ$ from the vertical to illuminate another point, D, the midpoint of AC.



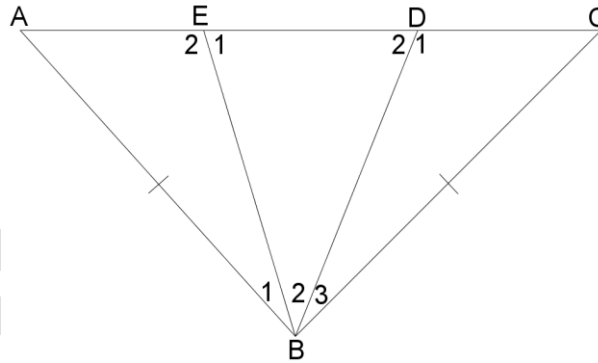
- 7.1 Calculate the length of DC. (3)
- 7.2 Calculate through how many degrees the spotlight must swing in order to illuminate point A (i.e. calculate θ). (3)
- [6]

QUESTION 8

- 8.1 In the diagram below, a polygon ABEFD is drawn. AD is produced to a point, C, that lies on BC. $AC \parallel FE$ Given $\hat{A} = 3x$, $\hat{B} = x$ and $\hat{ACB} = 2x$



- 8.1.1 Determine, with reasons, the numerical value of x . (2)
- 8.1.2 What type of triangle is $\triangle ABC$? Give a reason for your answer. (2)
- 8.2 In the diagram below $\triangle ABC$ is drawn. $AB = BC$ and $\hat{B}_1 = \hat{B}_3$.

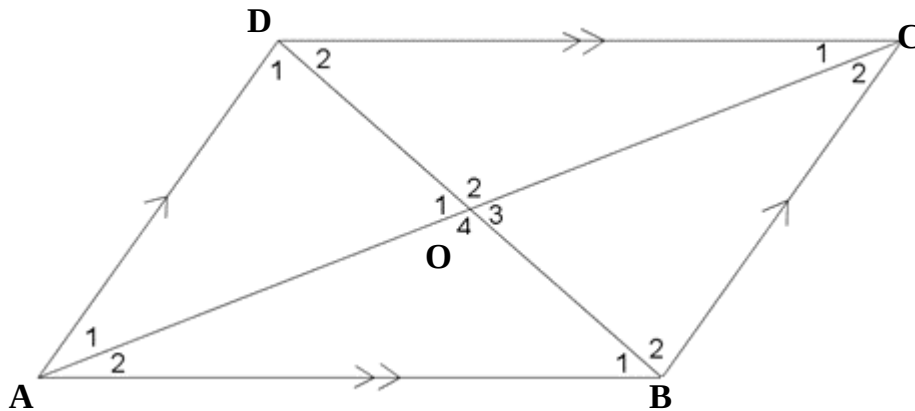


Prove that $\hat{E}_1 = \hat{D}_2$

(5)
[9]

QUESTION 9

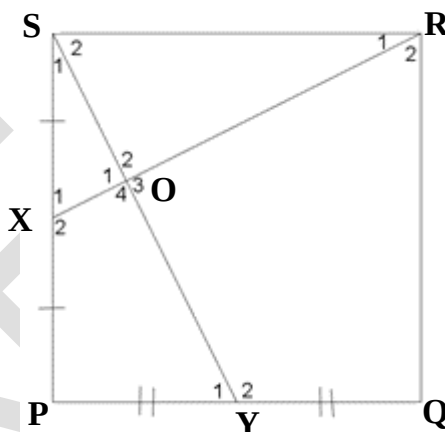
- 9.1 In the diagram below, a parallelogram ABCD is drawn such that $AD \parallel BC$ and $DC \parallel AB$. AC and DB intersect at point O.



Prove that $DO = OB$ and $AO = OC$.

(6)

- 9.2 PQRS is a square. X is a midpoint of SP, and Y is the midpoint of PQ.



- 9.2.1 Prove that $\triangle SPY \cong \triangle RSX$.

(6)

- 9.2.2 Given that $\hat{R}_1 = x$. Identify, with reasons, another angle equal to x .

(2)

- 9.2.3 Prove that $SY \perp RX$.

(5)

[19]

TOTAL: 100

END