Johannesburg North District

D(10)

GRADE 11
MATHEMATICS P2
JUNE EXAM 2025

Marks: 100 **Duration: 2 hours**

Surname & Name:		**Date:**	**12 June 2025**
Educator:		**Class:**	

Question	Content	Marks	Moderation			
			School	District	Provincial	Other
1	ANALYTICAL	24				
2	TRIGONOMETRY	29				
3	EUCLID GEO	17				
4	EUCLID GEO	17				
5	EUCLID GEO	13				
TOTAL		100				
DATE						
SIGNATURE						

This Question paper consists of 17 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of **FIVE** questions. Answer ALL the questions on this question paper.

2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answer.

3. You may use an approved scientific calculator (non-programmable and non- graphical), unless stated otherwise.

4. Answers only will not necessarily be awarded full marks.

5. If necessary, round-off answers to TWO decimal places, unless stated otherwise.

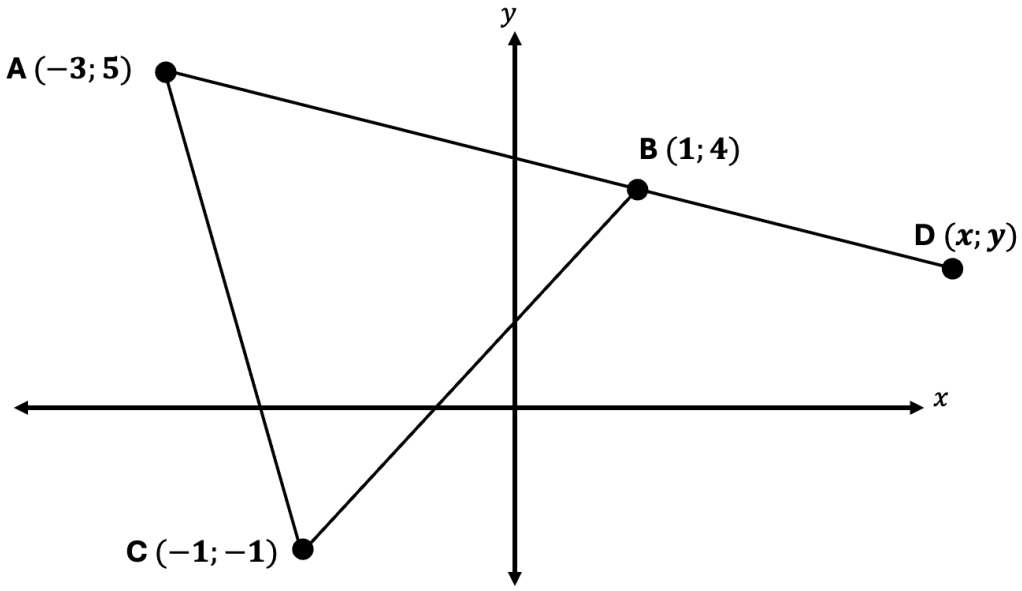
6. Diagrams are NOT necessarily drawn to scale.

7. An information sheet with formulae is included at the end of the question paper.

8. Write neatly and legibly.

Question 1

In the diagram below, triangle ABC has vertices A(−3; 5), B(1; 4) and C(−1; −1). AB is extended to D(x; y).



1.1 Determine the gradients of AB and BC. (4)

1.2 Are Lines AB and BC perpendicular to each other?
Explain by making necessary calculations . (2)

1.3 Determine the coordinates of D if B is the midpoint of AD. (2)

1.4 Determine the coordinates of K such that ABKC is a parallelogram. (2)

1.5 Find the length of the median, BM, of $\triangle ABC$, where M is the midpoint of AC. (4)

1.6 Find the equation of the line through B parallel to AC. (5)

1.7 Show that L $(-5; 22)$, not shown on the diagram lies on this line. (2)

1.8 Find the size of angle $A\hat{B}C$ correct to one decimal place. (3)

[24 Marks]

Question 2

2.1 If $13sin\theta - 5 = 0$ and $cos\theta < 0$, find the value of $24tan\theta + 26cos\theta$ with the aid of a sketch. (4)

Draw your sketch here.	Do your calculations here.

2.2 If $tan72^\circ = k$, find each of the following in terms of k :

2.2.1 $tan252^\circ$ (2)

2.2.2 $cos(-72^\circ)$ (2)

2.2.3 $\frac{sin108^\circ}{sin18^\circ}$ (3)

2.3 Simplify each of the following fully:

2.3.1 $\frac{sin(180^\circ - x).cos^2(x - 180^\circ).tanx}{cos(90^\circ - x).sin(360^\circ + x)}$ (5)

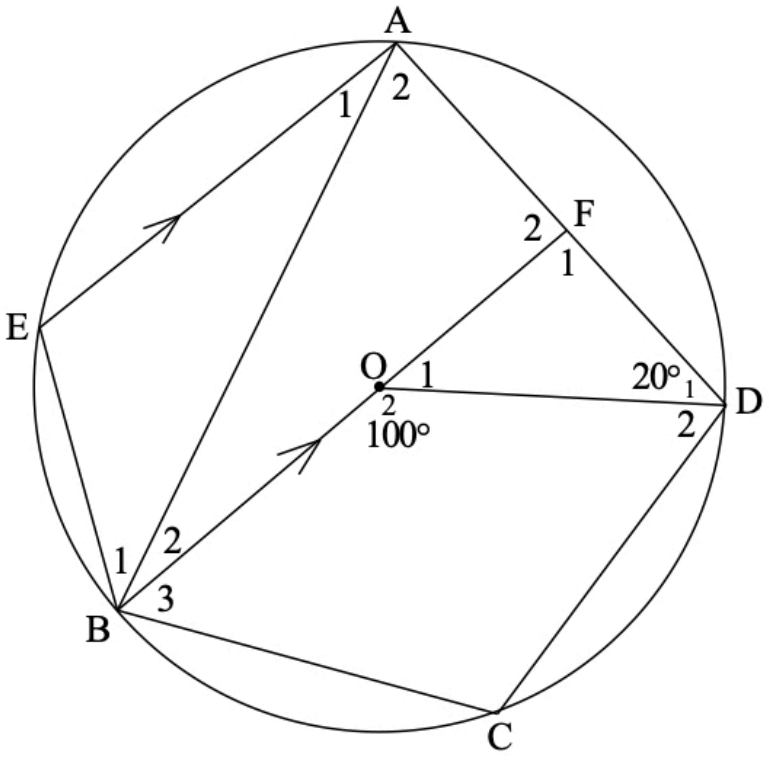
2.3.2 $\dfrac{sin210^\circ . cos150^\circ . tan25^\circ}{tan205^\circ . cos315^\circ . sin135^\circ}$ (7)

2.4 Determine the general solution of: $2sin^2x - 2sinx = cos^2x$ (6)

[29 Marks]

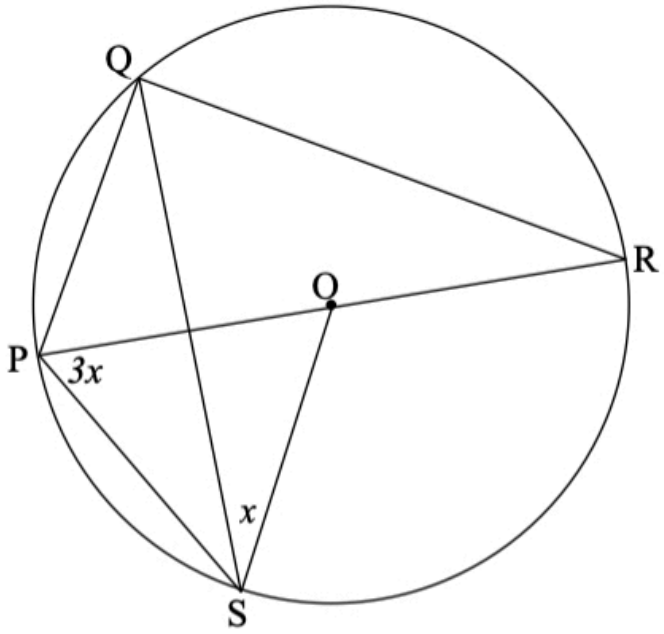
Question 3

3.1 In the diagram below, O is the centre of circle AEBCD, with line BOF ||EA. F lies on AD, $B\hat{O}D = 100^\circ$ and $\hat{D}_1 = 20^\circ$. The sizes of some of the angles are given in the table below. In each case, supply a valid reason. (5)



	STATEMENT	REASONS
3.1.1	$\hat{A}_2 = 50^\circ$	
3.1.2	$\hat{O}_1 = 80^\circ$	
3.1.3	$\hat{F}_1 = 80^\circ$	
3.1.4	$\hat{A}_1 = 30^\circ$	
3.1.5	$\hat{B}_2 = 30^\circ$	

3.2 P, Q and R are points on the circumference of the circle with centre O. PR is the diameter of the circle. $Q\hat{S}O = x$ and $O\hat{P}S = 3x$.



Express each of the following in terms of x, giving reasons for your answer:

3.2.1 $S\hat{Q}R$ (2)

STATEMENT	REASONS

3.2.2 $P\hat{Q}S$ (3)

STATEMENT	REASONS

3.2.3 $P\hat{S}Q$ (3)

STATEMENT	REASONS

3.2.4 $P\hat{R}Q$ (2)

STATEMENT	REASONS

3.2.5 $Q\hat{P}R$ (2)

STATEMENT	REASONS

[17 Marks]

Question 4

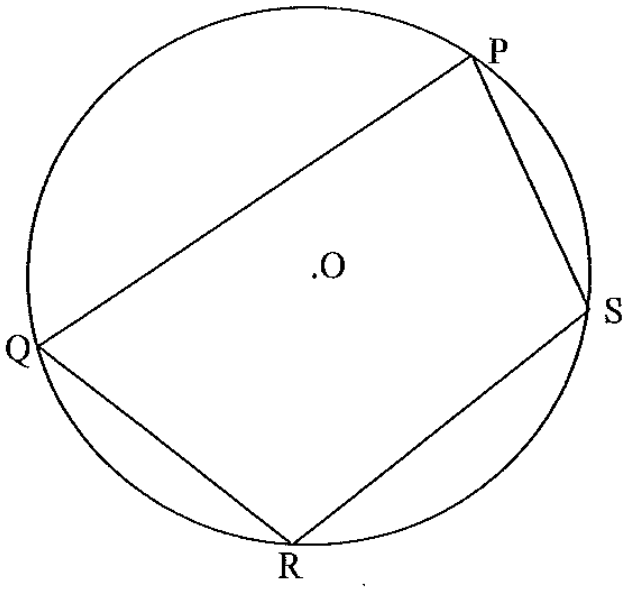
4.1 Complete the statements below by filling in the missing word(s) to make the statements correct .

4.1.1 A diameter subtends a _____ (1)

4.1.2 The exterior angle of cyclic quadrilateral is equal to_____ (1)

4.2 In the diagram below O is the centre of the circle . PQRS is cyclic quadrilateral.

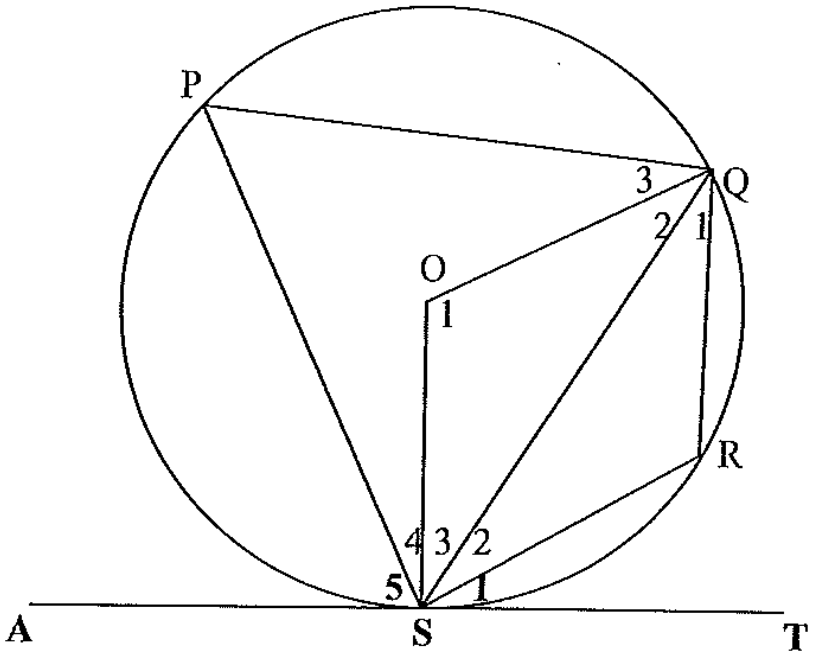
Prove the theorem which states that $\hat{P} + \hat{R} = 180^0$ (5)



STATEMENT	REASONS

4.3 In the diagram below, AST is a tangent to a circle with centre O at S.

$R\hat{S}Q = \hat{S}_1 = 23°$ and $QR = RS$.



Calculate the following angles, giving reasons to statements:

4.3.1 $Q\hat{S}R$ (4)

STATEMENT	REASONS

4.3.2 $\hat{R}$ (2)

STATEMENT	REASONS

4.3.3 $\hat{P}$ (2)

STATEMENT	REASONS

4.3.4 $\hat{O}_1$ (2)

STATEMENT	REASONS

[17 Marks]

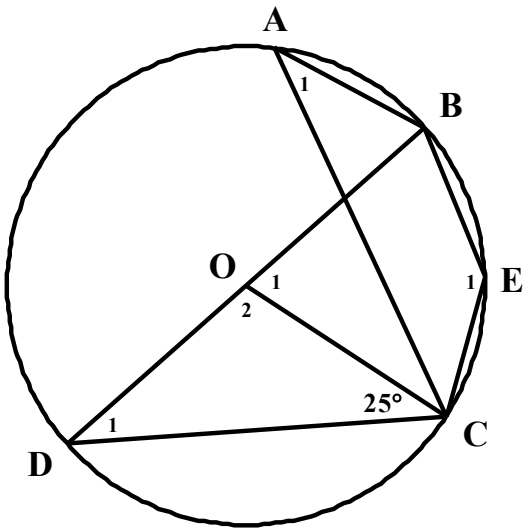
Question 5

5.1 In the diagram alongside O is the centre of the circle which passes through A, B, E, C and D.

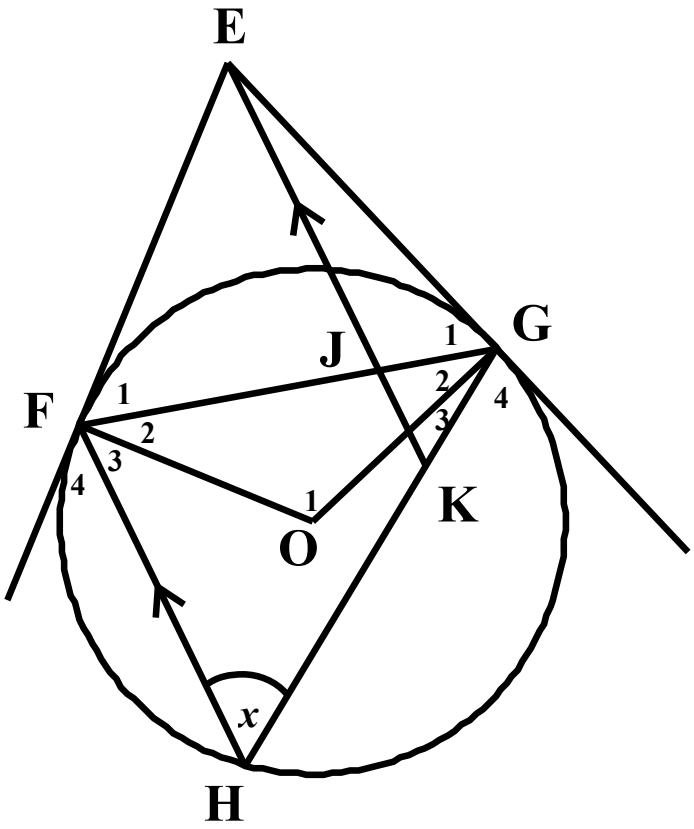
$D\hat{C}O = 25°$

With reasons find the Size of $\hat{E}_1$ (3)

STATEMENT	REASONS



5.2 In the diagram, EF and EG are tangents to circle with centre O. FH // EK, EK intersects FG at J and meets GH at K. $\hat{H} = x°$



Prove the following:

5.2.1 FOGE is a cyclic Quadrilateral (3)

STATEMENT	REASONS

5.2.2 EG is a tangent to the circle passing through G, J and K (4)

STATEMENT	REASONS

5.2.3 $F\hat{E}G = 180° - 2x$ (3)

STATEMENT	REASONS

TOTAL=100 marks **[13 Marks]**