

LEARNER NAME: _____

SCHOOL: _____

GRADE: 11 ☐

SOSHANGUVE PLC

GRADE 11

MATHEMATICS: PAPER 2

JUNE EXAMINATION

18 JUNE 2026

Marks: 100

Examiner: Maelane S.S

Duration: 2 hours

PLC Moderator: Mushakwa I

External Moderator: Shongwe S.S

	Mark	Learner Mark	Moderated mark
Question 1	26		
Question 2	12		
Question 3	19		
Question 4	08		
Question 5	12		
Question 6	15		
Question 7	08		
TOTAL	100		

This question paper consists of 23 pages

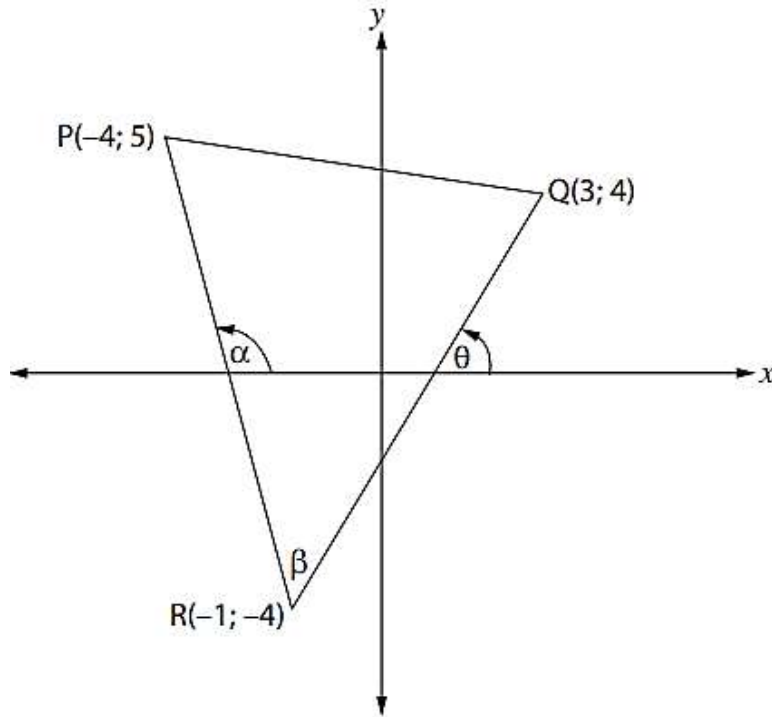
INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions

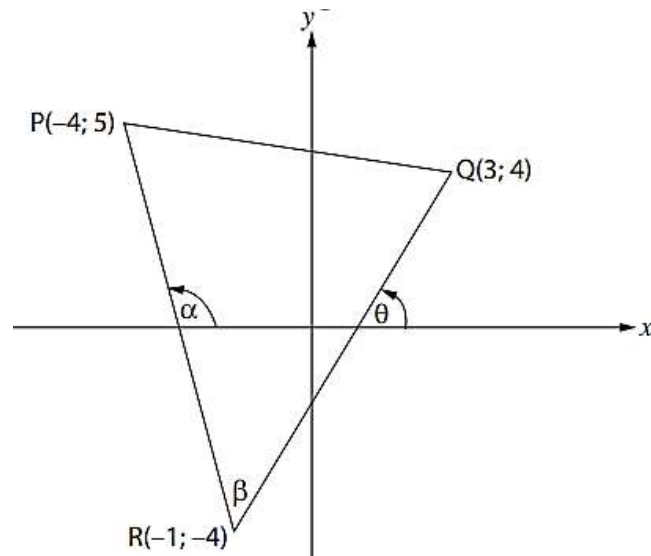
1. This DUAL QUESTION PAPER AND ANSWER BOOK consists of SEVEN questions. Answer ALL the questions in the spaces provided.
2. Clearly show ALL calculations used to obtain the answer
3. You may use a non-programmable calculator.
4. Answers only will not necessarily be awarded full marks.
5. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
6. Write neatly and legibly.

QUESTION 1

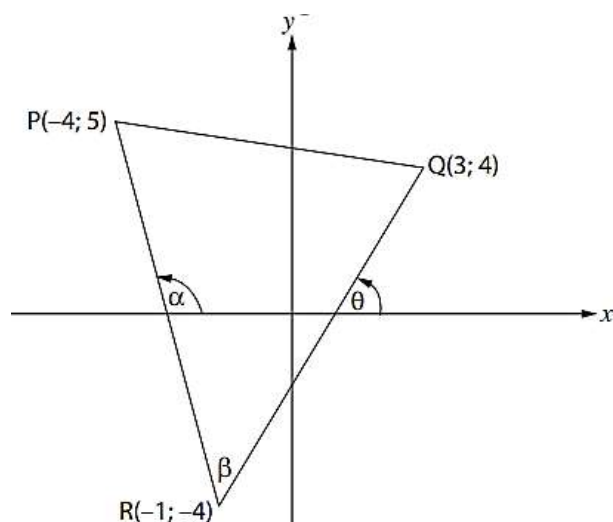
- 1.1 In the diagram, $P(-4; 5)$, $Q(3; 4)$ and $R(-1; -4)$ are the vertices of a triangle. θ and α are angles of inclination of QR and PR respectively.



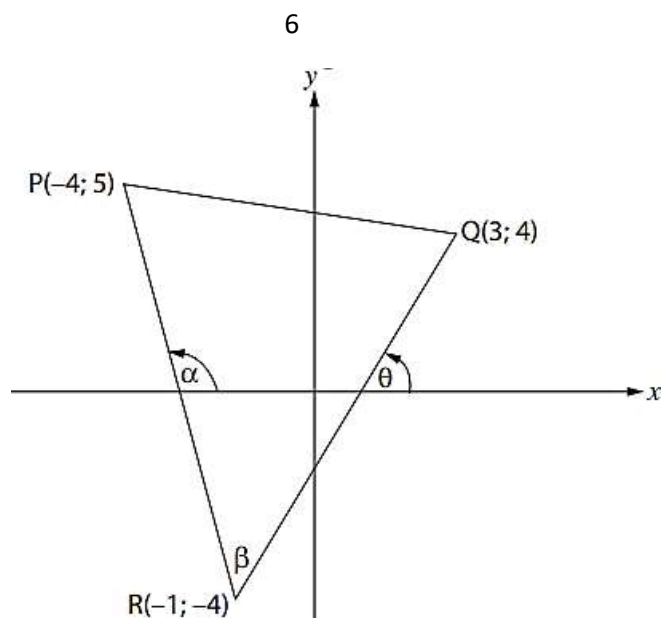
1.1.1	Calculate the length of RP.	(2)
	Solution	Marks
1.1.2	Calculate the gradient of RP.	(2)
	Solution	Marks



1.1.3	Determine coordinates of D, the midpoint of RP.	(2)
	Solution	Marks
1.1.4	Determine the equation of a line parallel RQ which passes through the origin.	(3)
	Solution	Marks



1.1.5	Calculate the coordinates of S if PQRS (in that order) is a parallelogram.	(3)
	Solution	Marks
1.1.6	Determine the size of β	(4)
	Solution	Marks



1.1.7	If V is a point on RP such that RP is perpendicular to VQ . Determine:		
	a)	The equation of line VQ	(3)
	Solution		Marks
	b)	The coordinates of point V if the equation of RP is $y + 3x + 7 = 0$	(4)
	Solution		Marks

	c)	The area of ΔPQR	(3)
	Solution		Marks
			[26]

	Additional space for question 1		
	Solution		Marks

QUESTION 2

2.1 Given: $\tan \alpha = \frac{4}{3}$ and $90^\circ < \alpha < 270^\circ$

With the aid of a sketch and, without using a calculator , determine the value of the following:		
	<u>Draw the sketch in the space below</u>	
2.1.1	$\cos \alpha$	(3)
	Solution	Marks
2.1.2	$\sin(\alpha - 90^\circ)$	(2)
	Solution	Marks

2.2	If $\cos 50^\circ = \frac{1}{m}$ express each of the following in terms of m , showing all your working	
2.2.1	$\sin 50^\circ$	(3)
	Solution	Marks
2.2.2	Show that: $2\cos^2 130^\circ - 2 = -2\sin^2 50^\circ$	(4)
	Solution	Marks
		[12]

QUESTION 3

3.1	Simplify to a single trigonometric ratio: $\frac{\sin x \cdot \tan x \cdot \cos 25^\circ}{\sin(90^\circ + x) \cdot \sin 425^\circ}$	(5)
	Solution	Marks
3.2	Prove the identity: $\frac{1}{\sin \alpha} - \sin \alpha = \frac{\cos \alpha}{\tan \alpha}$	(5)
	Solution	Marks

3.3	Consider the following equation: $3\sin^2 x + \cos^2 x - 5 = 7 \sin x$	
	3.3.1 Show that the equation $3\sin^2 x + \cos^2 x - 5 = 7 \sin x$ can be written as $2\sin^2 x - 7 \sin x - 4 = 0$	(1)
	Solution	Marks
	3.3.2 Hence, or otherwise, determine the general solution of $3\sin^2 x + \cos^2 x - 5 = 7 \sin x$	(5)
	Solution	Marks
3.4	Show that: $\tan 89^\circ \times \tan 88^\circ \times \tan 87^\circ \times \dots \times \tan 3^\circ \times \tan 2^\circ \times \tan 1^\circ = 1$	(3)
	Solution	Marks
		[19]

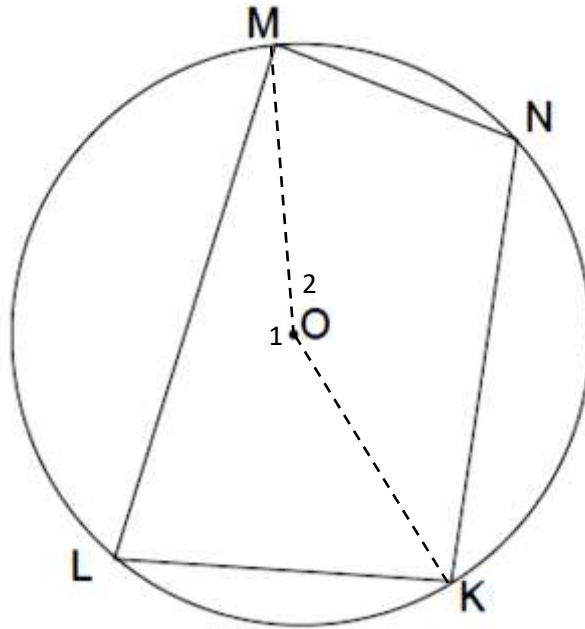
		Additional space for question 3	
	Solution		Marks

Provide reasons for your statements in QUESTIONS 4, 5, 6 and 7

QUESTION 4

4.1 In the diagram. K, L, M and N are points on the circle with centre O.

Construction: OM and OK are joined. $\hat{O}_1$ and $\hat{O}_2$ are created.

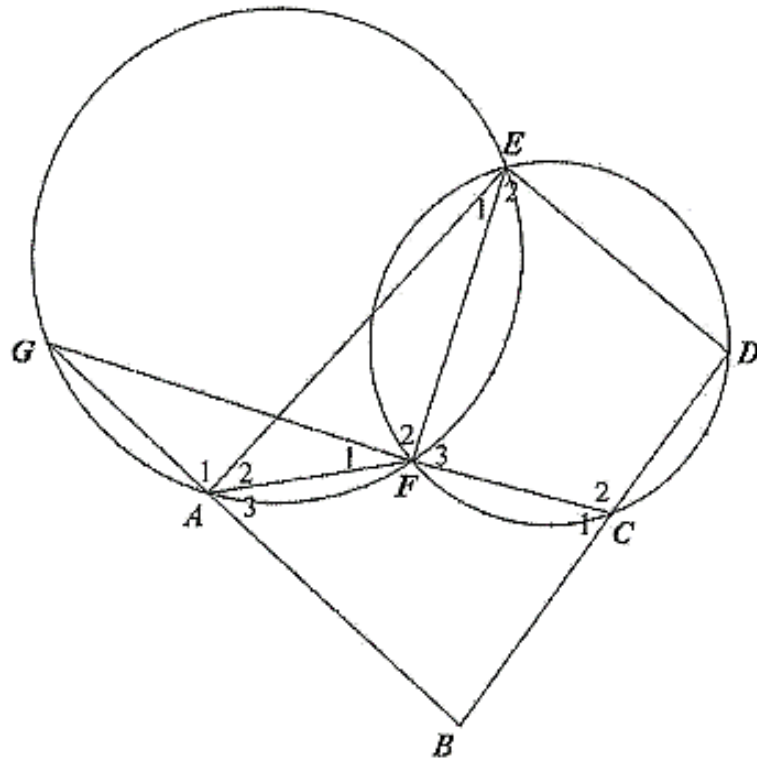


Prove the theorem which states that: $\hat{L} + \hat{N} = 180^\circ$

		(4)
	Solution	Marks

- 4.2 GAFE and FCDE are two circles. Chords GA, AF, EF, CF, CD and DE are drawn. GFC is a straight line. DC produced meets GA produced at B.

$$\hat{E}_1 = 28^\circ \text{ units and } \hat{E}_2 = 64^\circ.$$



Complete the table by filling in the appropriate reason for the given statements in the order given below

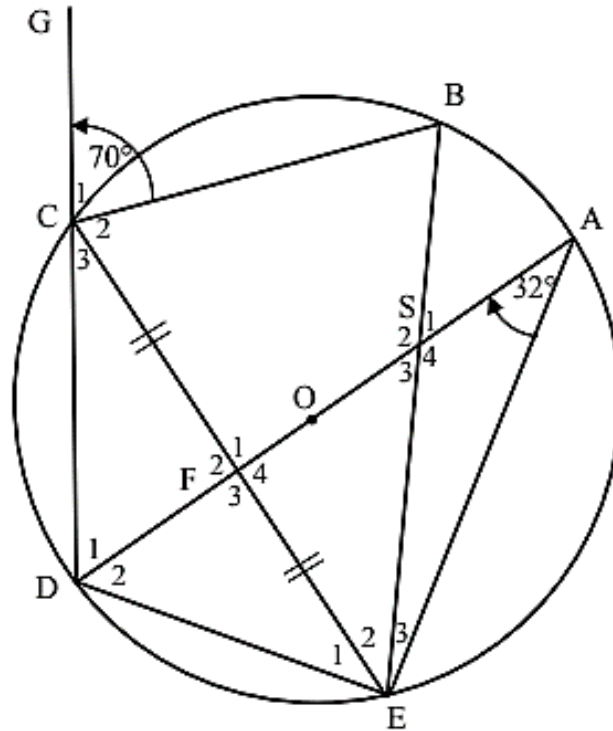
	Statement	Reason	
4.2.1	$\hat{C}_2 = 116^\circ$		(1)
4.2.2	$\hat{C}_1 = 64^\circ$		(1)
4.2.2	$\hat{G} = 28^\circ$		(1)
4.2.3	$\hat{B} = 36^\circ$		(1)
			[8]

[illegible]

QUESTION 5

A, B, C, D and E are points on the circle having centre O. DC is produced to G. Diameter AOD bisects chord CE in F, and intersects chord BE in S.

$\hat{A} = 32^\circ$ and $\hat{GCB} = 70^\circ$



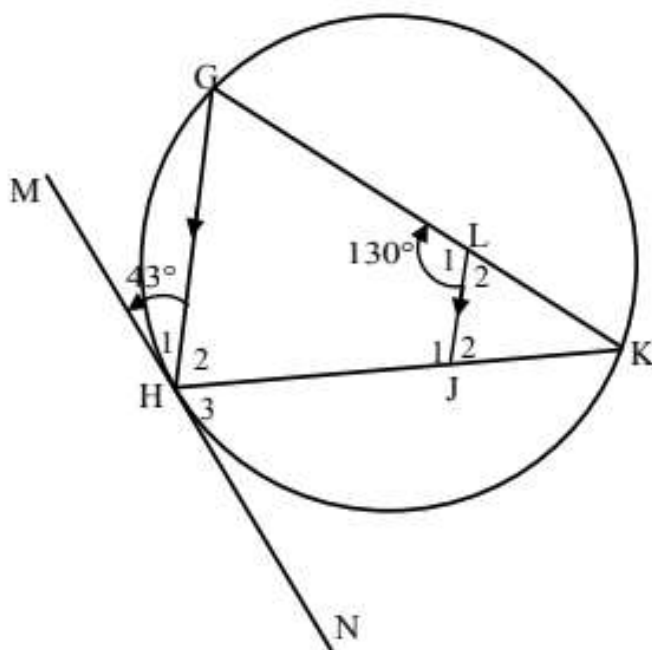
5.1	Identify TWO cyclic quadrilaterals	(2)
	Solution	Marks
Calculate, with reasons, the sizes of the following angles:		
5.2	$\hat{BED}$	(2)
	Solution	Marks

5.3	$\hat{E}_3$	(2)
	Solution	Marks
5.4	$\hat{C}_2$	(3)
	Solution	Marks
5.5	$\hat{S}_2$	(3)
	Solution	Marks
		[12]

QUESTION 6

- 6.1 MHN is a tangent to circle GHK at H. L is a point on GK and J a point on HK such that LJ is parallel to GH. $\hat{H}_1 = 43^\circ$ and $\hat{L}_1 = 130^\circ$

Calculate, with reasons, the size of:

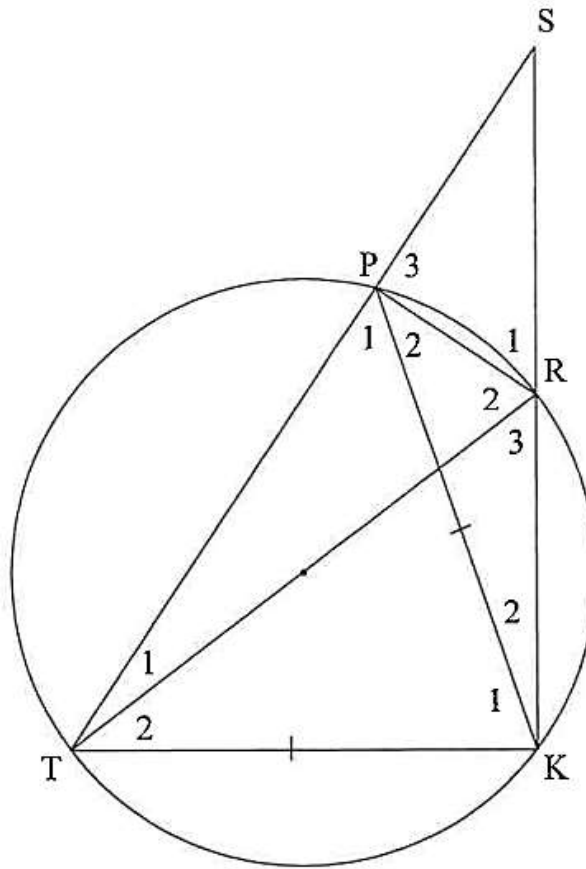


6.1.1	$\hat{R}$	(2)
	Solution	Marks
6.1.2	$\hat{H}_3$	(4)
	Solution	Marks

	6.1.3	Show that GHJL is not a cyclic quad	(3)
	Solution		Marks

	Additional space for question 5		
	Solution		Marks

- 6.2. In the diagram, TR is a diameter of the circle. PRKT is a cyclic quadrilateral. Chords TP and KR are produced to intersect at S. chord PK is drawn such that $PK = TK$.



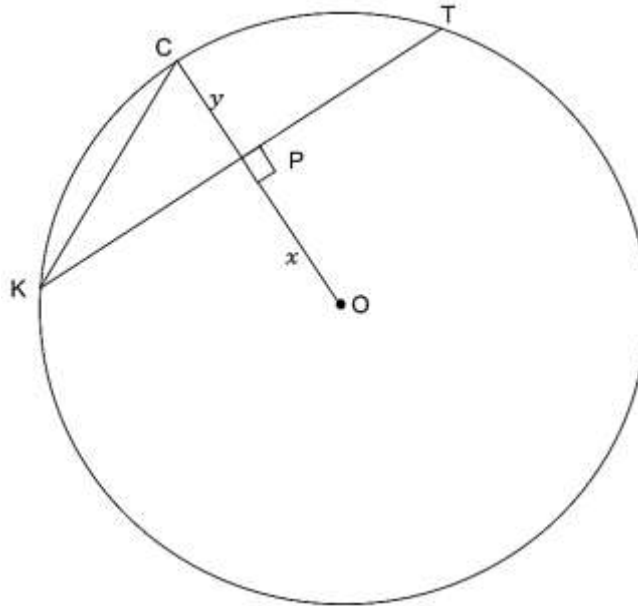
6.2.1	Prove that SR is a diameter of a circle passing through S, P and R	(4)
	Solution	Marks

	6.2.2	Find an angle equal to $\hat{P}_2$	(2)
	Solution		Marks
			[15]

[illegible]

QUESTION 7

In the diagram below, KT is a chord of Circle O . OC is drawn perpendicular to KT and cuts KT at P . $OP = x$ and $PC = y$.



7.1	Determine PT in terms of KT	(2)
	Solution	Marks
7.2	Prove that: $KC^2 = 2xy + 2y^2$	(6)
	Solution	Marks
		[8]

TOTAL=100 MARKS