LIMPOPO

PROVINCIAL GOVERNMENT

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF

EDUCATION

GRADE 11

MATHEMATICS

PAPER 2

JUNE EXAM 2026

MARKS: 100

DURATION: 2 HOURS

This question paper consists of 9 pages.

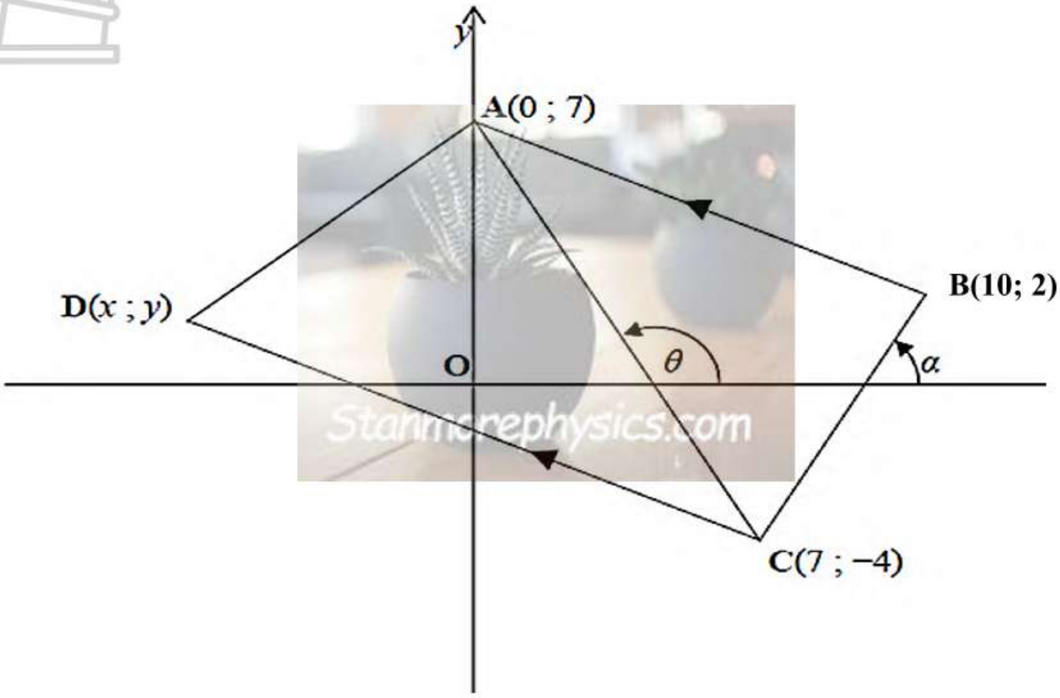
INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions

1. This question paper consists of 7 questions.
2. Answer all questions.
3. Clearly show ALL calculations, diagrams, graphs, ect. Which you have used in determining your answers.
4. Answers only will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Write neatly and legibly.

QUESTION 1

In the diagram below, the points A(0 ; 7), B (10 ; 2), C(7 ; -4) and D(x ; y) from quadrilateral ABCD. AB || CD, with AC joined. The angles of inclination for AC and BC are ϴ and α respectively.



Determine:

1.1 The length of AB (leave your answer in simplified surd form) (3)

1.2 The gradient of AC (2)

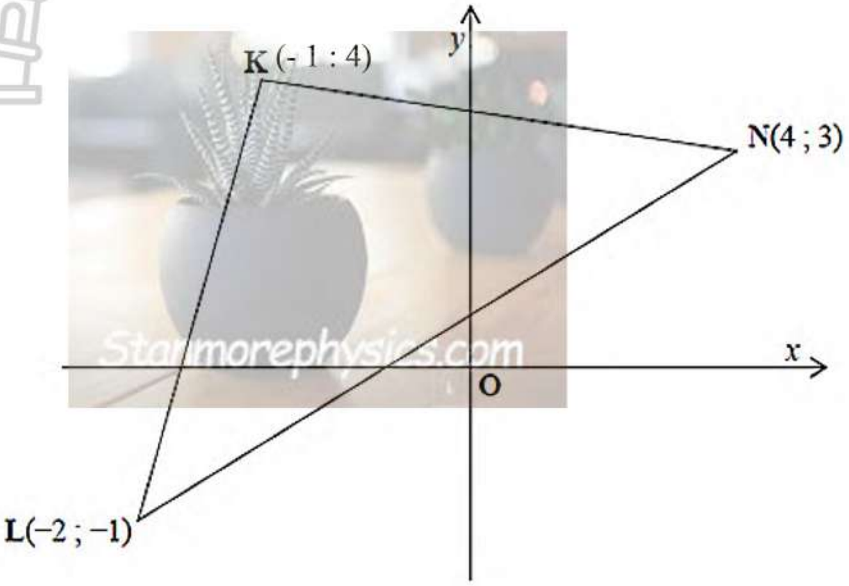
1.3 The size of ϴ, the angle of inclination of AC (3)

1.4 The equation of line DC (4)

[12]

QUESTION 2

Consider ΔKLN drawn below, with the coordinates K(-1;4) ; L(-2;-1) and N(4;3).
KL has the equation $y = 5x + 9$, while KN has the equation $5y + x - 19 = 0$.



2.1	Prove that KL ⊥ KN.	(3)
2.2	Hence or otherwise, determine the area of ΔKNL.	(4)
2.3	Determine the perpendicular bisector of LN.	(5)
2.4	If L, N and P (7 ; y) are collinear, find y.	(2)
2.5	Determine the coordinates of Q, if KLQN is a parallelogram.	(2)
		[16]

QUESTION 3

3.1 If $12tanB - 5 = 0$ and $90° \leq B \leq 360°$, determine the value of $sinB + cosB$ with the aid of the sketch. (6)

3.2 If $\sin 43° = p$, determine with the help of the triangle, the values of the following in terms of p.

3.2.1 x , the unknown side of the triangle (3)

3.2.2 $cos133°$ (3)

3.2.3 $\tan(-43°)$ (3)

3.3 Simplify each of the following fully, WITHOUT using a calculator:

3.3.1 $\dfrac{\sin(360°-x)}{\sin(90°-x)} \div \tan(180° - x)$ (5)

3.3.2 $\dfrac{tan205°.cos315°.\sin 135°}{sin210°.cos150°.tan25°}$ (8)

[28]

QUESTION 4

4.1 Prove that:

$\dfrac{sin\Theta - cos\Theta.sin\Theta}{cos\Theta-(1-sin^2\Theta)} = \tan\Theta$ (4)

4.2 Determine the general solution of $2sinxcosx - \cos^2 x = 0$ (7)

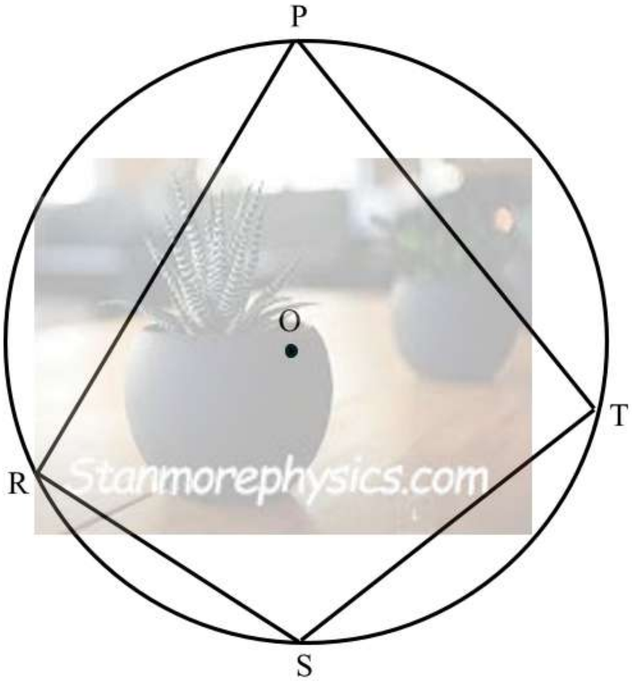
4.3 Solve for α if: $2\sqrt{sin\alpha} = 1$, where $\alpha \in [0°; 360°]$ (4)

4.4 If x and y are acute angles such that $\tan\left(\frac{x+y}{2}\right) = 1$ and $\cos(x - y) = \frac{\sqrt{2}}{2}$; find the values of x and y. (5)

[20]

QUESTION 5

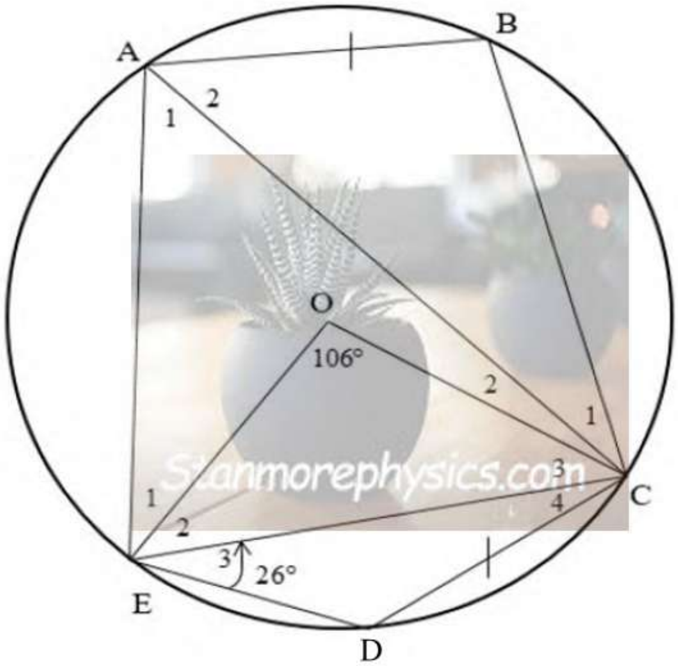
5.1 In the diagram below, O is the centre of the circle and PTSR is cyclic quadrilateral.



Prove the theorem that states that $\hat{P} + \hat{S} = 180°$. (5)

QUESTION 6

O is the centre of the circle ABCDE with DEC = 26°, AB=DC and EÔC = 106°



Calculate the size of:

6.1 $B\hat{C}A$ (2)

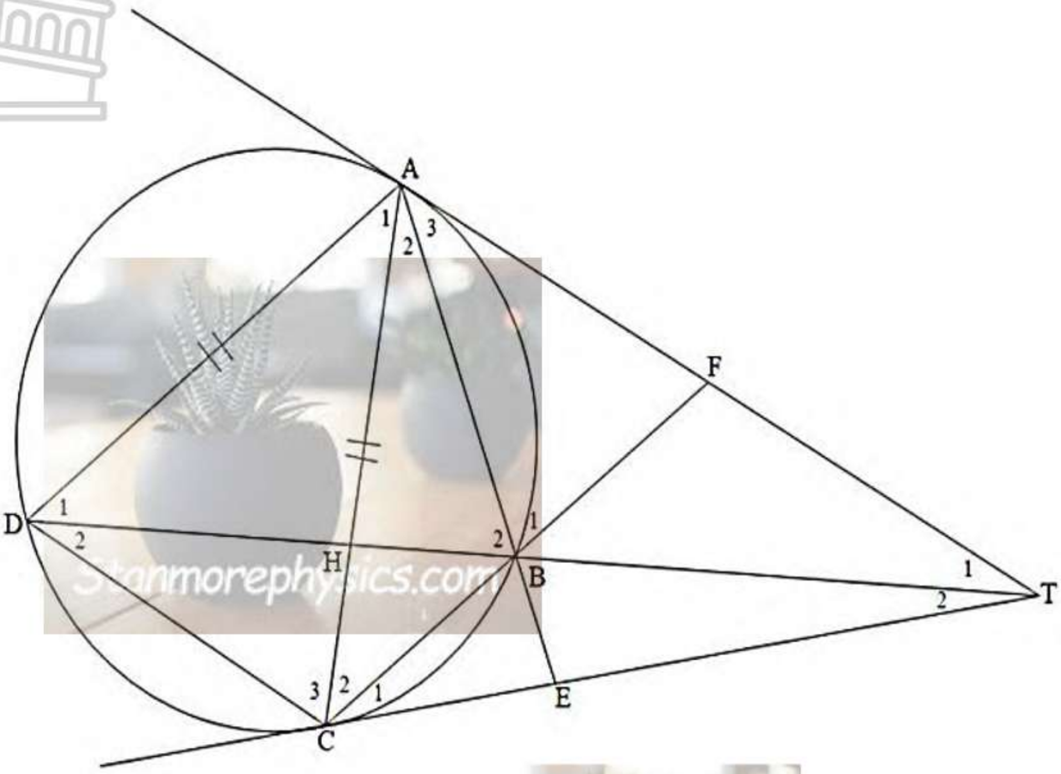
6.2 $\hat{A}_1$ (2)

6.3 $O\hat{C}D$ (6)

[10]

QUESTION 7

In the diagram below, ABCD is a cyclic quadrilateral with AC = AD. Tangents AC and CT touch the circle at A and C respectively.



Prove that:

7.1 $\hat{B}_1 = \hat{B}_2$ (4)

7.2 BECH is a cyclic quadrilateral (5)

[09]

TOTAL: 100

INFORMATION SHEET

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$A = P(1 + ni)$ $\qquad A = P(1 - ni)$ $\qquad A = P(1 - i)^n$ $\qquad A = P(1 + i)^n$

$T_n = a + (n-1)d$ $\qquad S_n = \frac{n}{2}\left[2a + (n-1)d\right]$

$T_n = ar^{n-1}$ $\qquad S_n = \frac{a(r^n - 1)}{r - 1}\ ;\ r \neq 1$ $\qquad S_\infty = \frac{a}{1-r}\ ;\ -1 < r < 1$

$F = \frac{x\left[(1+i)^n - 1\right]}{i}$ $\qquad P = \frac{x\left[1 - (1+i)^{-n}\right]}{i}$

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\qquad M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$

$y = mx + c$ $\qquad y - y_1 = m(x - x_1)$ $\qquad m = \frac{y_2 - y_1}{x_2 - x_1}$ $\qquad m = \tan\theta$

$$(x-a)^2 + (y-b)^2 = r^2$$

In ΔABC: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$a^2 = b^2 + c^2 - 2bc.\cos A$

$\text{area } \Delta ABC = \frac{1}{2}ab.\sin C$

$\sin(\alpha + \beta) = \sin\alpha.\cos\beta + \cos\alpha.\sin\beta$ $\qquad \sin(\alpha - \beta) = \sin\alpha.\cos\beta - \cos\alpha.\sin\beta$

$\cos(\alpha + \beta) = \cos\alpha.\cos\beta - \sin\alpha.\sin\beta$ $\qquad \cos(\alpha - \beta) = \cos\alpha.\cos\beta + \sin\alpha.\sin\beta$

$$\cos 2\alpha = \begin{cases} \cos^2\alpha - \sin^2\alpha \\ 1 - 2\sin^2\alpha \\ 2\cos^2\alpha - 1 \end{cases}$$

$\sin 2\alpha = 2\sin\alpha.\cos\alpha$

$\bar{x} = \frac{\sum x}{n}$ $\qquad \sigma^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}$

$P(A) = \frac{n(A)}{n(S)}$ $\qquad P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$\hat{y} = a + bx$ $\qquad b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$

