Johannesburg North District

D(10)

GRADE 11
MATHEMATICS P2
JUNE EXAM 2025

Marks: 100 **Duration: 2 hours**

MARKING GUIDELINE

• If a candidate answered a question TWICE, mark only the FIRST attempt.	• Consistent accuracy applies to ALL aspects of the marking guidelines.
• If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.	• It is unacceptable for candidates to use adopted values/answers in solving questions.
A – Accuracy	**C.A. – Consistent Accuracy**

This Marking Guideline consists of 9 pages

QUESTION 1

1.1	$m_{AB} = \frac{5-4}{-3-1}$ ✓ $= -\frac{1}{4}$ ✓ (2 or 0) $m_{BC} = \frac{4--1}{1--1}$ ✓ $= -\frac{5}{2}$ ✓ (2 or 0)	✓Substitution ✓m_{AB} ✓Substitution ✓m_{BC} (4)
1.2	NO ✓ m_{AB} x $m_{BC} \neq$ -1 ✓	✓NO ✓Product $\neq -1$ (2)
1.3	D(5; 3) ✓✓	✓ ✓Ans (2)
1.4	K(3; -2) ✓✓	✓ ✓Ans (2)
1.5	M(-2; 2) ✓ $BM^2 = (4-2)^2$ ✓ $+ (1- -2)^2$ ✓ $= 13$ $BM = \sqrt{13} = 3{,}61$ ✓	✓ Coordinates of M ✓ ✓Substitution ✓$BM = 13$ (4)
1.6	$m_{AC} = \frac{5-(-1)}{-3--1}$ ✓ $=$ -3 ✓ $\therefore \frac{y-4}{x-1}$ ✓ $=$ -3 ✓ $y - 4 = -3x + 3$ $\therefore \quad y = -3x + 7$ ✓	✓Substitution ✓ $m_{AC} = 3$ ✓ ✓Equating ✓Ans (5)
1.7	Sub in $(-5; 22)$ $22 = -3(-5) + 7$ True statement OR when $x = -5$, then $y = -3(-5) + 7 = 22$	✓Substitution ✓ Conclusion (2)

1.8	$\tan\theta_{BC} = m_{BC} = \frac{5}{2}$ $\therefore \theta_{BC} = 68{,}20°$ ✓ $\tan\theta_{AC} = m_{AB} = -3$ $\therefore \theta_{AC} = 108{,}43°$ ✓ $A\hat{C}B = \theta_{AB} - \theta_{AC} = 108{,}43° - 68{,}20°$ (CA) $= 40{,}2°$ ✓	✓68,20° ✓ 108,43° ✓ Ans (3)
24 MARKS		

QUESTION 2

2.1

$\sin\theta = \frac{5}{13}$

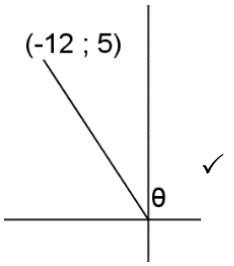
$x = -12$

$24\tan\theta + 26\cos\theta$

$= 24\left(\frac{5}{-12}\right) + 26\left(\frac{-12}{13}\right)$ ✓✓

$= -10 - 24$

$= -34$ ✓



✓Correct quad

✓ ✓ Substitution

✓ Ans

(4)

2.2.1

$\tan 252 = \tan 72$ ✓

$= k$ ✓

✓Reduction

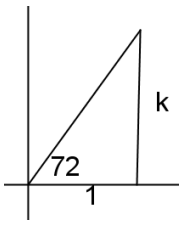
✓ Ans

(2)

2.2.2

$r = \sqrt{1+k^2}$ ✓

$\cos 72^\circ = \frac{1}{\sqrt{1+k^2}}$ ✓



✓$r = \sqrt{1+k^2}$

✓ Ans

(2)

2.2.3

$= \frac{\sin 72}{\cos 72}$ ✓

$= \tan 72$ ✓

$= k$ ✓

✓Reduction

✓ Identity

✓ Ans

(3)

2.3.1

$\frac{\sin x.(-\cos x)^2.\sin x}{\sin x.\sin x.\cos x}$ ✓✓✓✓

$= \cos x$ ✓

✓$sinx$

✓cos^2x

✓ $sinx$

✓ $sinx$

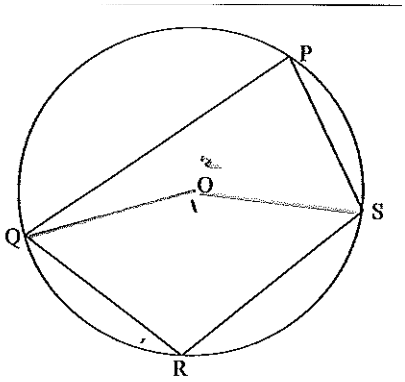
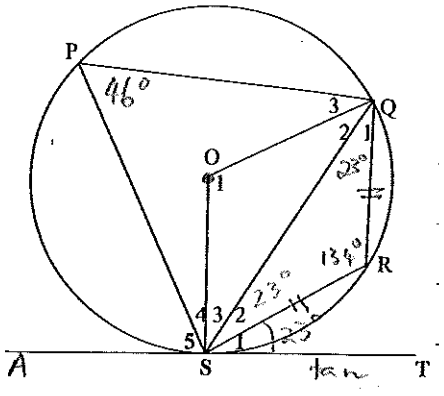
✓ Ans

(5)

2.3.2	$\frac{(-\sin 30)(-\cos 30)\tan 25}{\tan 25.\cos 45.\sin 45}$ ✓✓✓✓ $=\frac{\frac{1}{2}.\frac{\sqrt{3}}{2}}{\frac{\sqrt{2}}{2}.\frac{\sqrt{2}}{2}}$ ✓✓ $=\frac{\sqrt{3}}{2}$ ✓	✓$-sin30°$ ✓$-cos30°$ ✓ $sin45°$ ✓ $cos45°$ ✓ ✓Special $\angle's$ ✓ Ans (7)
2.4	$2sin^2x - 2sinx = 1 - sin^2x$ ✓ $3sin^2x - 2sinx - 1 = 0$ $(3sinx + 1)(sinx - 1) = 0$ ✓ $sinx = -\frac{1}{3}$ or $sinx = 1$ ✓ $x = 199{,}47° + k360°.\ , k \in Z$ $x = 80° + k360°., k \in Z$ OR ✓ OR. ✓ $x = 340{,}53° + k360°.\ , k \in Z$ $x = 270° + k360°, k \in Z$ Penalise once on paper if $k \in Z$ is never mentioned.	✓Identity ✓Factors ✓ Both Ref $\angle's$ ✓ Solutions for $sinx = -\frac{1}{3}$ ✓ Solutions for $sinx = -\frac{1}{3}$ ✓ $k \in R$ (6)
29 MARKS		

QUESTION 3		
3.1.1	< at centre = 2 x angle at the circumference	✓ for the answer
3.1.2	<'s on a straight line	✓ for the answer
3.1.3	Exterior angle of a triangle / <'s of a triangle	✓ for the answer
3.1.4	$\hat{A} = \hat{F}_1$; corresponding angles = ; EA∥BOF	✓ for the answer
3.1.5	alternate angles = ; EA∥BOF	✓ for the answer
3.2.1	$S\hat{Q}R = 3x$ (<s in the same segment)	✓ S ✓ R
3.2.2	$\hat{Q} = 90°$ (<s in a semi-circle) $\therefore P\hat{Q}S = 90° - 3x$	✓ S ✓ R ✓ answer
3.2.3	$P\hat{S}O = 3x$ (<s opposite equal sides) $\therefore P\hat{S}Q = 2x$ ($Q\hat{S}O = x$)	✓ S ✓ R ✓ answer
3.2.4	$P\hat{R}Q = 2x$ (<s in the same segment)	✓ S ✓ R
3.2.5	$Q\hat{P}R = 180° - (2x + 90°)$ (<s of a triangle) $= 90° - 2x$	✓ S ✓ R ✓ answer
17 MARKS		

QUESTION 4

4.1.1	The diameter subtends **a right angle at the circumference**	✓Ans (1)
4.1.2	The exterior angle of cyclic quadrilateral is equal to **the opposite interior angle**	✓Ans (1)
4.2	 Construct: Radii OQ and OS. $\hat{O}_1 = 2\hat{P}$ [∠ at center = 2 × ∠ at center] $\hat{O}_2 = 2\hat{R}$ [∠ at center = 2 × ∠ at center] $\hat{O}_1 + \hat{O}_2 = 360°$ [∠ around a point = 360°] $\therefore 2\hat{P} + R = \hat{360}°$ $2(\hat{P} + \hat{R}) = 360°$ $\therefore \hat{P} + \hat{R} = 180°$	✓Construction ✓S ✓R ✓S and. R ✓ Simplification (5)
4.3		

4.3.1	$\hat{Q}_1 = 23^\circ$ [tan chord] $\therefore \hat{S}_2 = 23^\circ$ [$\angle's$ opp = sides]	✓S ✓R ✓S ✓R (4)
4.3.2	$\hat{R} = 134^\circ$ [Sum of $\angle's$ of $\triangle$=180°]	✓S ✓R (2)
4.3.3	$\hat{P} = 46^\circ$ [opp$\angle's$ of cyclic quad=180°]	✓S ✓R (2)
4.3.4	$\hat{O}_1 = 92^\circ$ [$\angle$ at center = 2 $\times$ $\angle$ at center]	✓S ✓R (2)
17 MARKS		

QUESTION 5		
5.1	$\hat{D}_1 = 25°$ [$\angle's$ opp = radii] $\hat{E}_1 = 155°$ [opp $\angle's$ of Cyclic quad]	S/R ✓ S ✓ R ✓Ans (3)
5.2.1	$E\hat{F}O = 90°$ [rad ⊥ tan] ✓ $E\hat{G}O = 90°$ [rad ⊥ tan] ✓ ∴ FOGE is a cyclic quad [converse of opp $\angle's$ of Cyclic quad] ✓	✓S/R ✓S/R ✓ S/R (3)
5.2.2	$\hat{G}_1 = x$ [tan chord] ✓ $J\hat{K}G = x$ [corresp $\angle's$, EK ‖ FH] ✓ $\therefore \hat{G}_1 = J\hat{K}G$ ✓ EG is a talent to circle GK [converse of $\angle's$ in same seg] ✓	✓S/R ✓S/R ✓ S/R ✓ S/R (4)
5.2.3	$F\hat{O}G = 2x$ ✓ [$\angle'$ at centre = 2 × $\angle'$ at circum] ✓ $F\hat{E}G = 180° - 2x$[opp $\angle's$ of Cyclic quad] ✓	✓S ✓R ✓ S/R (3)
13 MARKS		