FINAL

KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL STANDARDISED ASSESSMENT

GRADE 11

MATHEMATICS P2

JUNE 2026

MARKING GUIDELINES

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MARKS: 100

These marking guidelines consist of 11 pages.

NOTE:

- Consistent accuracy applies in ALL aspects of the Marking Guidelines. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

LET WEL:

- *Volgehoue akkuraatheid word in ALLE aspekte van die Nasienriglyne toegepas. Hou op nasien by die tweede berekeningsfout.*
- *Aanvaar van antwoorde/waardes om 'n probleem op te los, word NIE toegelaat nie.*

GEOMETRY • MEETKUNDE	
S	**A mark for a correct statement** **(A statement mark is independent of a reason)**
	'n Punt vir 'n korrekte bewering **('n Punt vir 'n bewering is onafhanklik van die rede)**
R	**A mark for the correct reason** **(A reason mark may only be awarded if the statement is correct)**
	'n Punt vir 'n korrekte rede **('n Punt word slegs vir die rede toegeken as die bewering korrek is)**
S/R	**Award a mark if statement AND reason are both correct**
	Ken 'n punt toe as die bewering EN rede beide korrek is

QUESTION 1

1.1.1	$m_{AC} = \frac{6-1}{-7-3}$ $= -\frac{1}{2}$	✓A substitution ✓CA answer (2)
1.1.2	$\text{M}\left(\frac{3-7}{2}\ ;\ \frac{1+6}{2}\right)$ $\text{M}\left(-\frac{4}{2}\ ;\ \frac{7}{2}\right)$ $\text{M}\left(-2\ ;\ \frac{7}{2}\right)$ **Answer only: full marks**	✓CA substitution ✓CA answer (2)
1.1.3	Equation of AC: $y-y_1 = m(x-x_1)$ **OR** $y = mx+c$ $y-6 = -\frac{1}{2}(x+7)$ **OR** $1 = -\frac{1}{2}(3)+c$ $y-6 = -\frac{1}{2}x-\frac{7}{2}$ **OR** $c = \frac{5}{2}$ $y = -\frac{1}{2}x+\frac{5}{2}$ **OR** $y = -\frac{1}{2}x+\frac{5}{2}$ at K: $-\frac{1}{2}x+\frac{5}{2}=0$ $\therefore -x+5=0$ $\therefore x=5$ $\therefore \text{K}(5\ ;\ 0)$ **OR** $\frac{0-1}{x-3} = -\frac{1}{2}$ [collinear points $\therefore$ = gradients] $\frac{-1}{x-3} = \frac{-1}{2}$ $x-3=2$ $x=5$ $\therefore \text{K}(5\ ;\ 0)$	✓A substitution of m_{AC} and $\text{C}(-7\ ;\ 6)$ or $\text{A}(3\ ;\ 1)$ ✓CA Equation of AC ✓CA let $y = 0$ ✓CA x-value (CA if $x>0$) (4) **OR** ✓CA $y=0$ ✓CA $m_{AK} = \frac{-1}{x-3}$ ✓CA $m_{AK} = m_{AC}$ ✓ CA x-value (CA if $x>0$) (4)
1.1.4	$m_{AB} = \frac{3}{6} = \frac{1}{2}$ $m_{BC} = -\frac{8}{4} = -2$ $m_{AB} \times m_{BC} = \frac{1}{2} \times -2$ $= -1$ $\therefore \text{AB} \perp \text{BC}$	✓A $m_{AB} = \frac{3}{6} = \frac{1}{2}$ ✓ A $m_{BC} = -\frac{8}{4} = -2$ ✓A product of gradients = –1 (3)

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1.1.5	$AB=\sqrt{(3+3)^2+(1+2)^2}$ $AB=3\sqrt{5}$ $BC=\sqrt{(-7+3)^2+(6+2)^2}$ $BC=\sqrt{80}$ $BC=4\sqrt{5}$ Area of $\Delta ABC=\frac{1}{2}\times 3\sqrt{5}\times 4\sqrt{5}$ $=30$ square units	✓A substitution into distance formula ✓A length of AB ✓A length of BC ✓CA subst. of AB & BC into area form. ✓CA answer (5)
1.1.6	$m=\frac{1}{2}$ and $C(-7\,;6)$ [$\|\|$ lines $\therefore$ = gradients] $y-6=\frac{1}{2}(x+7)$ **OR** $6=\frac{1}{2}(-7)+c$ $y-6=\frac{1}{2}x+\frac{7}{2}$ **OR** $c=\frac{19}{2}$ $y=\frac{1}{2}x+\frac{19}{2}$ **OR** $y=\frac{1}{2}x+\frac{19}{2}$	✓CA new $m=m_{AB}$ ✓CA subst. of $C(-7\,;6)$ into eqn. of line ✓CA answer (3)
1.1.7	$\tan\beta=-\frac{1}{2}$ $\beta=180-\tan^{-1}\left(\frac{1}{2}\right)$ $\beta=153,43°$ $\tan\alpha=-2$ $\alpha=180-\tan^{-1}(2)$ $\alpha=116,57°$ $B\hat{C}A=\beta-\alpha$ $=153,43°-116,57°$ $=36,86°$ $=37°$ [correct to the nearest degree]	✓CA $\tan\beta=m_{AC}$ ✓CA β ✓CA $\alpha=116,57°$ ✓CA answer (4)
1.1.8	$D(-1\,;9)$	✓A x-value ✓A y-value (2)

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1.2	$x+3=0$ $\therefore x=-3$	✓A $x=-3$
	$\frac{1}{2}y+\frac{1}{3}(-3)-1=0$	✓CA substitution of $x=-3$
	$\frac{1}{2}y-1-1=0$ $\frac{1}{2}y=2$ $y=4$	✓CA y-value
	$\frac{1}{2}ky+\frac{3}{2}x+1=0$ $\frac{1}{2}k(4)+\frac{3}{2}(-3)+1=0$	✓CA substitution of $y=4$
	$2k=\frac{7}{2}$ $k=\frac{7}{4}$	✓CA answer (5)
		[30]

QUESTION 2

2.1.1	$\sin 17°=\frac{m}{1}$ $x^2=r^2-y^2$ $=1-m^2$ $x=\sqrt{1-m^2}$ $\tan 17°=\frac{m}{\sqrt{1-m^2}}$	✓A third side ✓CA answer (2)
2.1.2	$\sin(-107°)=-\sin 107°$ $=-\sin 73°$ **OR** $-\cos 17°$ $=-\sqrt{1-m^2}$	✓A $-\sin 107°$ ✓CA reduction (CA is on the negative) ✓CA answer (3)

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2.2.1	$\tan \hat{TOR} = -\sqrt{3}$ $\hat{TOR} = 180° - \tan^{-1}\left(\sqrt{3}\right)$ $\hat{TOR} = 120°$ $\therefore \hat{ROP} = 60°$ $\beta = 90° - 60°$ $\beta = 30°$	✓A $\tan \hat{TOR} = -\sqrt{3}$ ✓A $\hat{TOR} = 120°$ ✓A answer (3)
2.2.2	$\cos\left(\text{reflex } \hat{TOV}\right) = \frac{x}{20}$ and $\sin\left(\text{reflex } \hat{TOV}\right) = \frac{y}{20}$ $\cos 210° = \frac{x}{20}$ and $\sin 210° = \frac{y}{20}$ $x = 20 \times -\frac{\sqrt{3}}{2}$ and $y = 20 \times -\frac{1}{2}$ $x = -10\sqrt{3}$ and $y = -10$ $\therefore V\left(-10\sqrt{3}\ ;\ -10\right)$ **OR** $m_{OR} = -\sqrt{3}$ $\therefore m_{OV} = \frac{1}{\sqrt{3}}$ $\therefore$ Equation of OV: $y = \frac{1}{\sqrt{3}}x$ $\therefore V\left(x\ ;\ \frac{1}{\sqrt{3}}x\right)$ $(x-0)^2 + \left(\frac{1}{\sqrt{3}}x - 0\right)^2 = OV^2$ $x^2 + \frac{1}{3}x^2 = 20^2$ $\frac{4}{3}x^2 = 400$ $x^2 = 300$ $x = \pm\sqrt{300}$ $x = -10\sqrt{3}$ $y = \frac{1}{\sqrt{3}}\left(-10\sqrt{3}\right)$ $= -10$ $\therefore V\left(-10\sqrt{3}\ ;-10\ \right)$	✓A correct trig ratios ✓A substitution ✓A special angle values (3) **OR** ✓A equation of OV ✓A substitution ✓A simplification (3)
		[11]

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GRADE 11
Marking Guideline

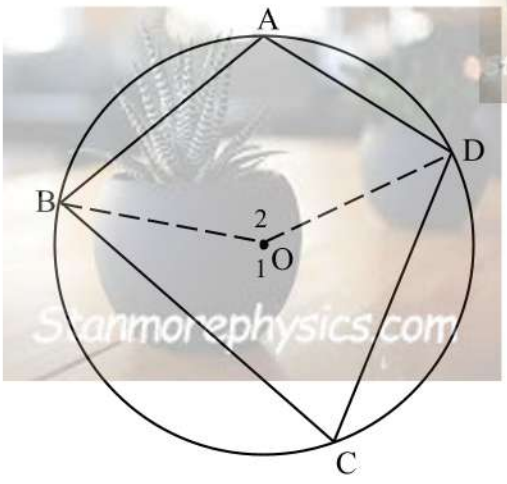
QUESTION 3

3.1	$\frac{\tan(180°-x).\cos^2(180°+x)}{\cos(x+90°).\sin(x-360°)} = \frac{-\tan x.(-\cos x)^2}{(-\sin x).(+\sin x)}$ $= \frac{-\frac{\sin x}{\cos x}.\frac{\cos^2 x}{1}}{-\sin^2 x}$ $= \frac{\sin x.\cos x}{\sin^2 x}$ $= \frac{\cos x}{\sin x}$ $= \frac{1}{\tan x}$	✓A $\tan(180°-x) = -\tan x$ ✓A $\cos^2(180°+x) = (-\cos x)^2$ ✓A $\cos(x+90°) = -\sin x$ ✓A $\sin(x-360°) = \sin x$ A✓ $\tan x = \frac{\sin x}{\cos x}$ ✓CA answer (6)
3.2	$\frac{\cos(-225°).\sin 135° + \sin 330°}{\tan 45°} = \frac{\cos 225°.\sin 135° + \sin 330°}{\tan 45°}$ $= \frac{-\cos 45°.\sin 45° + (-\sin 30°)}{\tan 45°}$ $= \frac{-\frac{\sqrt{2}}{2}.\frac{\sqrt{2}}{2} - \frac{1}{2}}{1}$ $= -1$	A✓ $\cos(-225°) = -\cos 45°$ A✓ $\sin 135° = \sin 45°$ A✓ $\sin 330° = -\sin 30°$ A✓ substitution of special angle values ✓CA answer (5)
3.3	$LHS = \frac{1}{\cos\theta} - \frac{\cos\theta}{1+\sin\theta}$ $= \frac{1+\sin\theta-\cos^2\theta}{\cos\theta(1+\sin\theta)}$ $= \frac{\sin^2\theta+\sin\theta}{\cos\theta(1+\sin\theta)}$ $= \frac{\sin\theta(1+\sin\theta)}{\cos\theta(1+\sin\theta)}$ $= \tan\theta$ $= RHS$	✓A numerator ✓A LCD ✓A $1-\cos^2\theta = \sin^2\theta$ ✓A factorisation of numerator (4)

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3.4	$\sin(x-30°)=\cos 2x$ $\sin(x-30°)=\sin(90°-2x)$ $x-30°=90-2x+k.360°$ or $x-30°=180°-(90°-2x)+k.360°$ $3x=120°+k.360°$ or $-x=120°+k.360°$ $x=40°+k.120°;k\in Z$ or $x=-120°+k.360°;k\in Z$ **OR** $\sin(x-30°)=\cos 2x$ $\cos[90°-(x-30°)]=\cos 2x$ $\cos(120°-x)=\cos 2x$ $120°-x=2x+k.360°$ or $120-x=360°-2x+k.360°$ $-3x=-120°+k.360°$ or $x=240°+k.360°;k\in Z$ $x=40°+k.120°;\ k\in Z$	✓A $\cos 2x=\sin(90°-2x)$ ✓A both quadrants ✓CA value for x ✓CA value for x ✓CA $k.120°;\ k\in Z$ (5) **OR** ✓A $\sin(x-30°)$ $=\cos[90°-(x-30°)]$ ✓A both quadrants ✓CA value for x ✓CA value for x ✓CA $k.120°;k\in Z$ (5)
		[20]

QUESTION 4

4.1	 RTP: $\hat{A}+\hat{C}=180°$ Construction: Draw OB and OD or Join O to B and O to D Proof: $\hat{O}_1=2\hat{A}$ [∠ @ centre = 2×∠ @ circum.] and $\hat{O}_2=2\hat{C}$ [∠ @ centre = 2×∠ @ circum.] but $\hat{O}_1+\hat{O}_2=360°$ [∠s around a point] $\therefore 2\hat{A}+2\hat{C}=360°$ $\therefore \hat{A}+\hat{C}=180°$	✓construction ✓S/ R ✓ S/R ✓S/R ✓ S (5)

4.2.1	$\hat{L}_2 + \hat{L}_3 = \hat{S}_1 = 48°$ $\hat{L}_2 = 24°$	[Exterior ∠ of a cyclic quad.]	✓ S ✓R ✓ answer (3)
4.2.2	$L\hat{P}S = 90°$ $\hat{S}_4 = 90° - 24°$ $= 66°$	[angle in the semi-circle] [sum of angles of Δ]	✓S ✓R ✓ answer (3)
4.2.3	$\hat{K} = 180° - \hat{S}_4$ $= 180° - 66°$ $= 114°$	[opposite ∠s of a cyclic quad.]	✓R ✓ answer (2)
4.2.4	$\hat{R} = \hat{L}_2 = 24°$	[∠s in same segment]	✓S ✓R (2)
4.2.5	$\hat{O}_3 = 2\hat{S}_4 = 2(66°)$ $= 132°$ **OR** $\hat{O}_3 = 180° - 48°$ $= 132°$	[∠ @ centre = 2×∠ @ circumf.] [sum of angles in a Δ]	✓R ✓ answer **OR** (2) ✓R ✓ answer (2)
			[17]

QUESTION 5

5.1	Two tangents drawn from the same point.		✓ answer (1)
5.2	$\hat{A} = \frac{1}{2}(2x)$ $= x$	[∠ @ centre = 2×∠ @ circum.]	✓S ✓R
	$\hat{D}_1 = \hat{A} = x$	[∠s in the same segment] **OR** [∠ @ centre = 2×∠ @ circum.]	✓S/R
	$\hat{C}_3 = \hat{D}_1 = x$	[∠s opposite = sides] **OR** [exterior ∠ of Δ]	✓S/R (4)
5.3	$\hat{M}_2 = 90°$ $\hat{C}_3 = x$ $\therefore \hat{O}_2 = 90° - x$	[line from centre to midpoint of chord] [proved in 5.2] [sum of ∠s in a Δ]	✓S ✓R (2)
5.4	$\therefore \hat{O}_2 = 90° - x$ $O\hat{C}E = 90°$ $\hat{C}_3 = x$ $\therefore \hat{C}_4 = \hat{O}_2 = 90° - x$ $\therefore$ EC is a tangent	[proved in 5.3] [rad ⊥ tan] [proved in 5.1] [converse tan chord theorem]	✓S/R ✓S ✓ R (3)

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5.5	$\hat{M}_3 = 90°$	[line from centre to midpoint of chord]	✓S/R
	$\hat{C}_4 = 90° - x$	[proved in 5.4]	
	$\therefore M\hat{E}C = x$		
	but $\hat{D}_1 = x$	[proved in 5.2]	✓S
	$\therefore \hat{D}_1 = M\hat{E}C = x$		
	$\therefore$ DOCE is a cyclic quadrilateral	[converse ∠s in the same segment]	✓R (3)
	OR		**OR**
	$O\hat{D}E = 90°$	[rad ⊥ tan]	✓S/R
	$O\hat{D}E + O\hat{C}E = 180°$		✓S
	$\therefore$ DOCE is a cyclic quadrilateral	[converse opposite ∠s of a cyclic quad]	✓R (3)
			[13]

QUESTION 6

6.1	$\hat{A}_1 = 90° - x$	[sum of ∠s of a Δ]	✓S/R
	$A\hat{C}F = 90°$	[∠ in the semi-circle]	✓S/R
	$\hat{C}_1 = \hat{F}_1 = x$	[tan chord theorem]	✓S/R
	$\therefore \hat{A}_2 = 90° - x$	[sum of ∠s of a Δ]	
	$\therefore \hat{A}_1 = \hat{A}_2$		✓S
	$\therefore$ CA bisects $B\hat{A}O$		(4)
6.2	$C\hat{E}F = 180° - \hat{A}_2$	[opposite ∠s of a cyclic quad.]	✓S/R
	$= 180° - (90° - x)$		
	$= 180° - 90° + x$		
	$= 90° + x$		✓size of $C\hat{E}F$
	$\hat{O}_1 = 2\hat{F}_1 = 2x$	[∠ @ centre = 2×∠ @ circum.]	✓S/R
	$\hat{C}_3 = \hat{F}_1 = x$	[∠s opposite = sides/radii]	✓S/R
	$\hat{G}_1 = 90°$	[∠ in the semi-circle]	
	$\therefore \hat{O}_2 = 90° - x$	[sum of ∠s of a Δ]	
	$G\hat{O}A = \hat{O}_1 + \hat{O}_2$		
	$= 2x + 90° - x$		
	$= 90° + x$		✓size of $G\hat{O}A$
	$\therefore C\hat{E}F = G\hat{O}A$		(5)
	OR		**OR**

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	$C\hat{E}F = 180° - \hat{A}_2$ $= 180° - (90° - x)$ $= 180° - 90° + x$ $= 90° + x$ $\hat{G}_1 = 90°$ $\hat{G}_2 = 90°$ $\hat{C}_1 = \hat{F}_1 = x$ $\therefore G\hat{O}A = 90° + x$ $\therefore C\hat{E}F = G\hat{O}A$	[opposite ∠s of a cyclic quad.] [∠ in the semi-circle] [adj. ∠s on a straight line] [proved in 6.1] [exterior ∠ of Δ]	✓S/R ✓size of $C\hat{E}F$ ✓S/R ✓S/R ✓size of $G\hat{O}A$ (5)
			[9]

TOTAL: 100 MARKS

