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**AMENDMENT TO MARKING GUIDELINES
PREPARATORY EXAMINATIONS – 2024**

FOR ATTENTION:

THE CHIEF INVIGILATOR

SUBJECT / VAK	TECHNICAL MATHEMATICS / TEGNIESE WISKUNDE
PAPER / VRAESTEL	2
DATE OF EXAMINATION	3 SEPTEMBER 2024

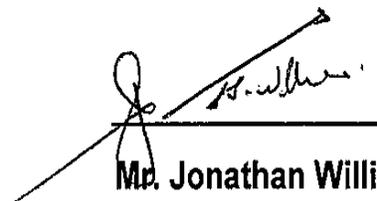
The errata for the Marking Guidelines of TECHNICAL MATHEMATICS P2 has reference.

There was an OMISSION OF FORMULAE in **Question 11** on both the English and Afrikaans versions of the question paper. This matter was addressed at the Marking Standardisation Meeting.

To ensure that candidates are not disadvantaged and prejudiced in any way, you are advised to please ask your Technical Mathematics educator(s) to **ignore Questions 11.1.1 to 11.1.4** when marking. In other words, the paper must be marked out of a total of 141 instead of 150 and then the learners' marks must be converted to a mark out of 150. E.g., Should a learner attain 85/141 then that mark is recalculated as 91/150.

Use the formula: $\frac{a}{141} \times 100 = b$. Then, $\frac{b}{100} \times 150 = c$

c is the mark that is entered into SASAMS out of 150.


Mr. Jonathan Williams

DIRECTOR: EXAMINATIONS MANAGEMENT

3 September 2024





GAUTENG PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

**PREPARATORY EXAMINATIONS
VOORBEREIDENDE EKSAMEN
2024**

**OFFICIAL MARKING GUIDELINES/
AMPTELIKE NASIENRIGLYNE**

**TECHNICAL MATHEMATICS/TEGNIJSE WISKUNDE
(PAPER/VRAESTEL 2)**

16 pages/bladsye

Marking Codes/Nasienkodes	
A	Accuracy/Akkuraatheid
CA	Consistent accuracy/Volgehoue akkuraatheid
M	Method/Metode
R	Rounding/Afronding
NPR	No penalty for rounding/Geen penalisering vir afronding nie
NPU	No penalty for units omitted/Geen penalisering indien eenhede weggelaat is nie
S	Simplification/Vereenvoudiging
SF	Substitution in correct formula/Vervanging in korrekte formule
ST	Statement/Bewering
ST/RE	Statement and Reason/Bewering en Rede



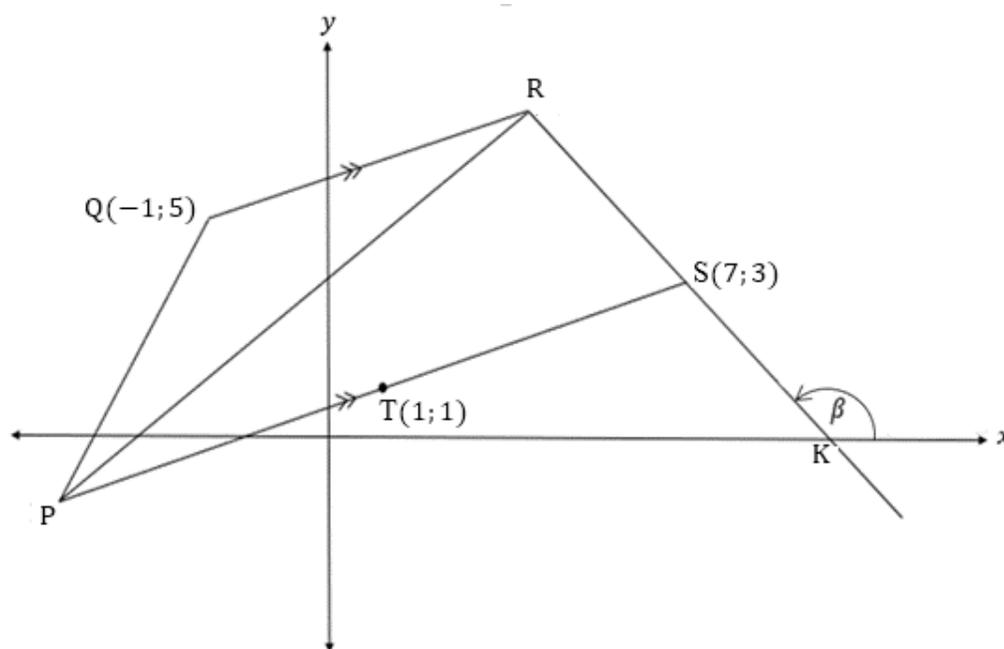
SA EXAM
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NOTES:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out an attempt of a question and did not redo it, mark the crossed-out version.
- Consistent accuracy applies in all aspects of the marking guidelines.

LET WEL:

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.
- As 'n kandidaat 'n poging van 'n vraag deurgehaal het en dit nie oorgedoen het nie, sien die doodgetrekte weergawe na.
- Volgehoue akkuraatheid is deurgaans op alle aspekte van die nasienriglyne van toepassing.

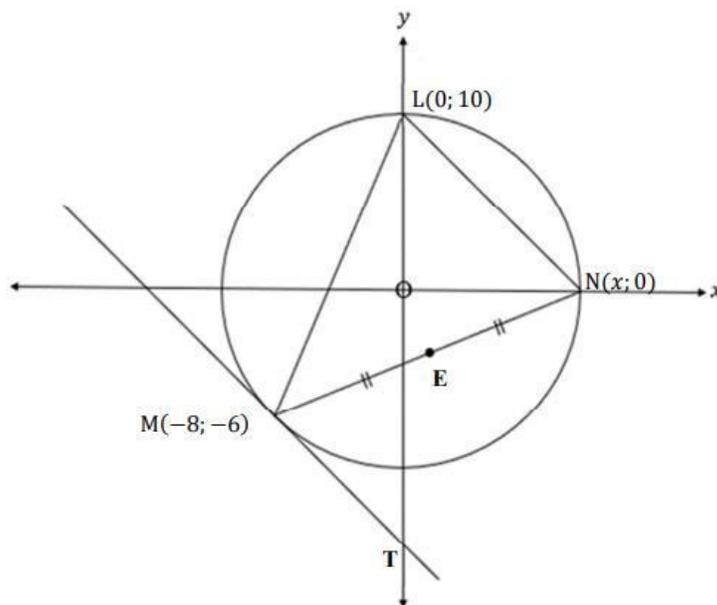
QUESTION/VRAAG 1

1.1	$0 = -2x + 17$ $2x = 17$ $x = \frac{17}{2}$ $K\left(\frac{17}{2}; 0\right)$ or/of $K\left(8\frac{1}{2}; 0\right)$ or/of $K(8,5; 0)$	$\checkmark y = 0$ A $\checkmark x = \frac{17}{2}$ CA	(2)
1.2	$\beta = \tan^{-1}(2)$ $\therefore \text{Ref/Verw. } \angle = 63,43^\circ$ $\beta = 180^\circ - 63,43^\circ$ $\therefore \beta = 116,57^\circ$	\checkmark SF A $\checkmark 63,43^\circ$ CA $\checkmark 116,57^\circ$ CA	(3)

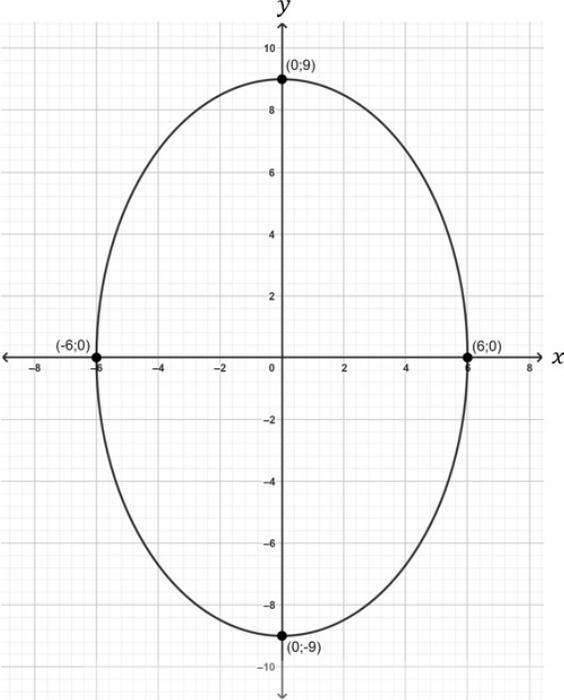
1.3	<p>Midpoint/Middelpunt</p> $T_x = \frac{x_S + x_P}{2}$ $1 = \frac{7 + x_P}{2}$ $2 - 7 = x_P \quad \text{OR/OF}$ $\therefore x_P = -5$ <p>Midpoint/Middelpunt</p> $T_y = \frac{y_S + y_P}{2}$ $1 = \frac{3 + y_P}{2}$ $2 - 3 = y_P$ $\therefore y_P = -1$ $P(-5; -1)$	<p>Translation/Translasie:</p> <p>S(7; 3) → T(1; 1)</p> <p>(x - 6; y - 2)</p> <p>T(1; 1) → P(x; y)</p> <p>P(1 - 6; 1 - 2)</p> <p>P(-5; -1)</p> <p>✓ M A</p> <p>✓ $x_P = -5$ A</p> <p>✓ $y_P = -1$ A</p> <p>AO: Full marks/ Volpunte (3)</p>
1.4	$m_{SP} = \frac{y_P - y_S}{x_P - x_S}$ $m_{SP} = \frac{-1 - 3}{-5 - 7}$ $m_{SP} = \frac{-4}{-12}$ $m_{SP} = \frac{1}{3}$ <p style="text-align: center;">OR/OF</p> $m_{SP} = \frac{y_S - y_T}{x_S - x_T}$ $m_{SP} = \frac{3 - 1}{7 - 1}$ $m_{SP} = \frac{2}{6}$ $m_{SP} = \frac{1}{3}$ <p style="text-align: center;">OR/OF</p> $m_{SP} = \frac{y_P - y_T}{x_P - x_T}$ $m_{SP} = \frac{-1 - 1}{-5 - 1}$ $m_{SP} = \frac{-2}{-6}$ $m_{SP} = \frac{1}{3}$	<p>✓ SF CA</p> <p>✓ $m_{SP} = \frac{1}{3}$ CA</p> <p style="text-align: center;">OR/OF</p> <p>✓ SF CA</p> <p>✓ $m_{SP} = \frac{1}{3}$ CA</p> <p style="text-align: center;">OR/OF</p> <p>✓ SF CA</p> <p>✓ $m_{SP} = \frac{1}{3}$ CA</p> <p style="text-align: right;">(2)</p>

QUESTION/VRAAG 2

2.1



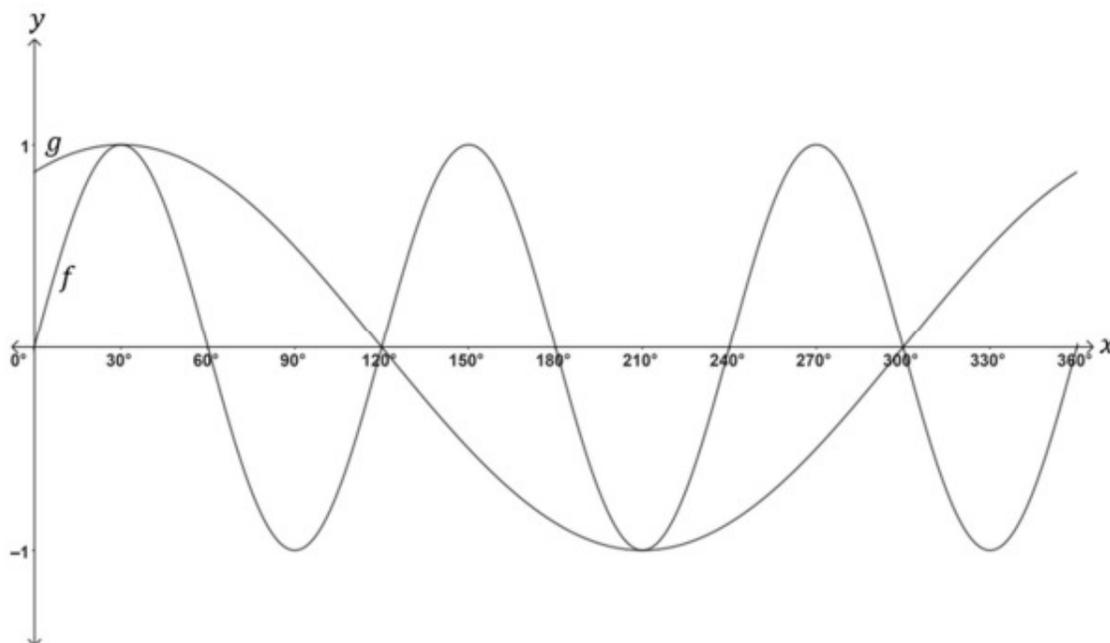
2.1.1	$r^2 = x^2 + y^2$ $r^2 = (0)^2 + (10)^2$ $r^2 = 100$ $x^2 + y^2 = 100$ <p style="text-align: center;">OR/OF</p> $r^2 = x^2 + y^2$ $r^2 = (-8)^2 + (-6)^2$ $r^2 = 100$ $x^2 + y^2 = 100$	✓ SF A ✓ $x^2 + y^2 = 100$ CA <p style="text-align: center;">OR/OF</p> ✓ SF A ✓ $x^2 + y^2 = 100$ CA (2)
2.1.2	N(10; 0) ACCEPT/AANVAAR: $x = 10$ and/en 10	✓ N(10; 0) A (1)
2.1.3	$E\left(\frac{x_M+x_N}{2}; \frac{y_M+y_N}{2}\right)$ $E\left(\frac{-8+10}{2}; \frac{-6+0}{2}\right)$ E(1; -3) $LE = \sqrt{(0-1)^2 + (10-(-3))^2}$ $LE = \sqrt{1+169}$ $LE = \sqrt{170}$ $LE = 13,04$	✓ $x = 1$ CA ✓ $y = -3$ A ✓ SF CA ✓ 13,04 CA PR (4)

2.1.4	$m_r = \frac{-6-0}{-8-0}$ $m_r = \frac{3}{4}$ $\therefore m_t = -\frac{4}{3}$ $y - (-6) = -\frac{4}{3}[x - (-8)]$ $y = -\frac{4}{3}x - \frac{32}{3} - 6$ $\therefore y = -\frac{4}{3}x - \frac{50}{3}$ <p style="text-align: center;">OR/OF</p> $x \cdot x_1 + y \cdot y_1 = r^2$ $x(-8) + y(-6) = 100$ $-6y = 8x + 100$ $y = -\frac{4}{3}x - \frac{50}{3}$	$\checkmark m_r = \frac{3}{4}$ A $\checkmark m_t = -\frac{4}{3}$ CA \checkmark SF CA $\checkmark y = -\frac{4}{3}x - \frac{50}{3}$ CA <p style="text-align: center;">OR/OF</p> \checkmark F A \checkmark SF (-8; -6) A \checkmark SF 100 A $\checkmark y = -\frac{4}{3}x - \frac{50}{3}$ CA (4)
2.2.1	$\frac{x^2}{36} + \frac{y^2}{81} = 1$ $\frac{x^2}{6^2} + \frac{y^2}{9^2} = 1$	$\checkmark 6^2$ and/en 9^2 A (1)
2.2.2		\checkmark Shape/Vorm A \checkmark All 4 intercepts/ Al 4 afsnitte CA (2)
		[14]

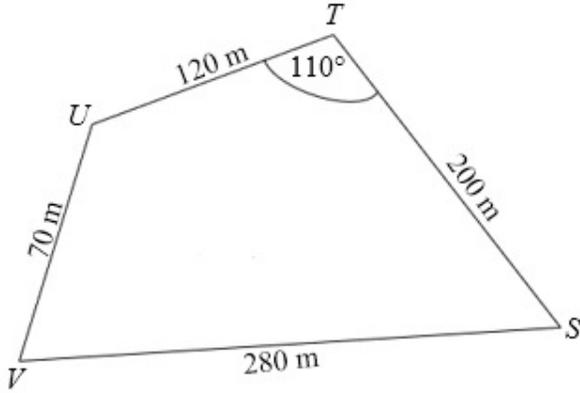
3.1.3	$\sin A = \frac{3}{5}$ $A = \sin^{-1}\left(\frac{3}{5}\right)$ $\therefore A = 36,87^\circ$ <p style="text-align: center;">OR/OF</p> $\cos A = \frac{8}{10}$ $A = \cos^{-1}\left(\frac{4}{5}\right)$ $\therefore A = 36,87^\circ$ <p style="text-align: center;">OR/OF</p> $\tan A = \frac{6}{8}$ $A = \tan^{-1}\left(\frac{3}{4}\right)$ $\therefore A = 36,87^\circ$	<p>✓ Ratio A</p> <p>✓ 36,87° CA</p> <p>OR/OF</p> <p>✓ Ratio A</p> <p>✓ 36,87° CA</p> <p>OR/OF</p> <p>✓ Ratio A</p> <p>✓ 36,87° CA</p> <p>(2)</p>
3.1.4	$\tan B = -0,3$ $\tan B = -\frac{3}{t}$ $-0,3 = -\frac{3}{t}$ $t = 10$	<p>✓ Ratio A</p> <p>✓ SF A</p> <p>✓ $t = 10$ CA</p> <p>(3)</p>
3.2	$\cot(m + n)$ $m = 1,427 \times \frac{180^\circ}{\pi} = 81,76^\circ$ $n = 3,324 \times \frac{180^\circ}{\pi} = 190,45^\circ$ $= \cot(1,427 + 3,324) = \cot(81,76^\circ + 190,45^\circ)$ $= \cot(4,751) = \cot 272,21^\circ$ $= \frac{1}{\tan(4,751)} = \frac{1}{\tan 272,21^\circ}$ $= -0,04 = -0,04$	<p>✓ SF A</p> <p>✓ I A</p> <p>✓ -0,04 CA</p> <p>NPR (3)</p>
		[14]

QUESTION/VRAAG 4			
4.1	$\operatorname{cosec}^2 x - 1 = \cot^2 x$	✓ I	A (1)
4.2	$\frac{\tan(180^\circ + x) \cdot \sin(360^\circ - x) \cdot \cos 225^\circ}{\sin^2 x \cdot \tan \frac{5\pi}{4}}$ $= \frac{\tan x \cdot -\sin x \cdot \cos(180^\circ + 45^\circ)}{\sin^2 x \cdot \tan(\pi + \frac{\pi}{4})}$ $= \frac{\frac{\sin x}{\cos x} \cdot -\sin x \cdot (-\cos 45^\circ)}{\sin^2 x \cdot \tan(\frac{\pi}{4})}$ $= \frac{-\sin^2 x \cdot (-\frac{\sqrt{2}}{2})}{\sin^2 x \cdot (1)}$ $= \frac{\sqrt{2}}{2 \cos x} \text{ or/of } = \frac{\sqrt{2}}{2} \sec x$	✓ $\tan x$ ✓ $-\sin x$ ✓ $-\cos 45^\circ$ ✓ $\tan(\frac{\pi}{4})/\tan 45^\circ$ ✓ $\frac{\sin x}{\cos x}$ ✓ $\frac{-\sqrt{2}}{2}$ ✓ S ✓ $\frac{\sqrt{2}}{2} \sec x$	A A A A A CA CA (8)
4.3	$\sin(\theta + 40^\circ) = \frac{\sqrt{3}}{2}$ Ref/Verwys $\angle = \sin^{-1} \frac{\sqrt{3}}{2}$ Ref/Verwys $\angle = 60^\circ$ $\theta + 40^\circ = 60^\circ$ or/of $\theta + 40^\circ = 180^\circ - 60^\circ$ $\theta = 20^\circ$ or/of $\theta = 80^\circ$	✓ Ref/Verwys $\angle = 60^\circ$ ✓ $\theta = 20^\circ$ ✓ $\theta = 80^\circ$	A CA CA (3)
			[12]

QUESTION/VRAAG 5



5.1	$-1 \leq y \leq 1$ $y \in [-1; 1]$	OR/OF	$\checkmark \leq y \leq$ or/of [;] $\checkmark -1 \& 1$	A A (2)
5.2	120°		$\checkmark 120^\circ$	A (1)
5.3	$f(360^\circ) - g(360^\circ)$ $= \sin 3x - \cos(x - 30^\circ)$ $= \sin 3(360^\circ) - \cos(360^\circ - 30^\circ)$ $= -\frac{\sqrt{3}}{2}$ or/of $-0,87$		\checkmark SF $\checkmark -\frac{\sqrt{3}}{2}$	A CA AO: Full marks/Volpunte (2)
5.4	$x = 30^\circ$ $x = 120^\circ$ $x = 210^\circ$		$\checkmark 30^\circ$ $\checkmark 120^\circ$ $\checkmark 210^\circ$	A A A (3)
5.5	$180^\circ < x < 240^\circ$ $(180^\circ; 240^\circ)$	OR/OF	$\checkmark < x <$ or/of (;) $\checkmark 180^\circ \& 240^\circ$	A A (2)
				[10]

QUESTION/VRAAG 6			
6.1.1	$\frac{\sin A}{a} = \frac{\sin C}{c}$	✓ $\sin C$	A (1)
6.1.2	$b^2 = a^2 + c^2 - 2ac \cdot \cos B$	✓ b^2	A (1)
6.2			
			
6.2.1	$US^2 = UT^2 + TS^2 - 2 \cdot UT \cdot TS \cdot \cos \hat{T}$ (In ΔUTS) $US^2 = (120)^2 + (200)^2 - 2(120)(200)\cos 110^\circ$ $US^2 = 70\,816,967$ $US = 266,11 \text{ m}$	✓ SF ✓ S ✓ 266,11 NPU	A CA CA (3)
6.2.2	$US^2 = UV^2 + VS^2 - 2 \cdot UV \cdot VS \cdot \cos \hat{V}$ (In ΔUVS) $(266,11)^2 = (70)^2 + (280)^2 - 2(70)(280)\cos \hat{V}$ $-12\,485,4679 = -39\,200\cos \hat{V}$ $\hat{V} = \cos^{-1}(0,31851)$ $\hat{V} = 71,43^\circ$ <p style="text-align: center;">OR/OF</p> $\cos V = \frac{UV^2 + VS^2 - US^2}{2UV \cdot VS}$ $\cos V = \frac{(70)^2 + (280)^2 - (266,11)^2}{2(70)(280)}$ $\hat{V} = \cos^{-1}(0,31851)$ $\hat{V} = 71,43^\circ$	✓ SF ✓ S ✓ \cos^{-1} ✓ $71,43^\circ$ <p style="text-align: center;">OR/OF</p> ✓ SF ✓ S ✓ \cos^{-1} ✓ $71,43^\circ$	CA CA A CA <p style="text-align: center;">OR/OF</p> CA CA A CA (4)

6.2.3	Area of/van $\Delta UTS = \frac{1}{2} \cdot UT \cdot TS \cdot \sin \hat{T}$	✓ 11 276,31	CA
	Area of/van $\Delta UTS = \frac{1}{2} \times 120 \times 200 \times \sin 110^\circ$		
	Area of/van $\Delta UTS = 11\,276,31 \text{ unit}^2$		
	Area of/van $\Delta UVS = \frac{1}{2} \cdot UV \cdot VS \cdot \sin \hat{V}$		
	Area of/van $\Delta UVS = \frac{1}{2} \cdot 70 \times 280 \times \sin 71,43^\circ$	✓ 9 289,76	CA
	Area of/van $\Delta UVS = 9289,76 \text{ unit}^2$		
	The area of the plot/Die area van die grond = 11 276,31 + 9289,76	✓ M	A
	The area of the plot/Die area van die grond = 20 566,08 m ²	✓ 20 566,08	CA (4)
			[13]

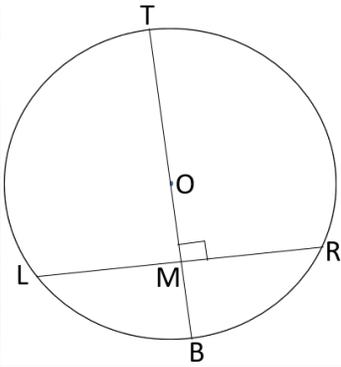
QUESTION/VRAAG 7			
7.1	perpendicular/loodreg	✓ ST	A (1)
7.2			
7.2.1	$\hat{A}_2 = 30^\circ$	tan-chord theorem <i>∠ raaklyn-koord</i>	✓ ST ✓ RE A A (2)
7.2.2	In ΔABC $A\hat{T}C = 90^\circ$ $30^\circ + 90^\circ + T\hat{C}O = 180^\circ$ $T\hat{C}O = 60^\circ$ $\hat{T}_3 = 90^\circ - 30^\circ$ $\hat{T}_3 = 60^\circ$ $TO = CO$ $T\hat{C}O = \hat{T}_3$ $T\hat{C}O = 60^\circ$	 \angle in semicircle <i>∠ in halwe sirkel</i> sum of \angle ' of Δ <i>binne $\angle^e \Delta$</i> OR/OF tan. \perp radius <i>raaklyn \perp radius</i> Radii <i>Radiusse</i> \angle^s opp. = sides \angle^e teenoor = sye	✓ ST ✓ RE CA A ✓ ST CA OR/OF ✓ ST/RE CA ✓ ST/RE A ✓ ST CA (3)

7.2.3	<p>In ΔAOT $\hat{T}_2 = \hat{A}_2$ $\hat{T}_2 = 30^\circ$</p> <p style="text-align: center;">OR/OF</p> <p>In ΔCAT $\hat{T}_2 = 90^\circ - 60^\circ$ $\hat{T}_2 = 30^\circ$</p>	<p>\angle^s opp. = sides \angle^e teenoor = sye</p> <p>\angle in semi circle \angle in halwe sirkel</p>	<p>✓ ST CA ✓ RE A</p> <p style="text-align: center;">OR/OF</p> <p>✓ ST CA ✓ RE A (2)</p>
7.2.4	<p>$\hat{B}\hat{C}\hat{T} = \hat{S}\hat{T}\hat{C}$ $\hat{B}\hat{C}\hat{T} = 30^\circ$ $\hat{A}_1 = \hat{B}\hat{C}\hat{T}$ $\hat{A}_1 = 30^\circ$</p>	<p>Alt. $\angle^s =$; $BC \parallel TS$ Verw. $\angle^e =$; $BC \parallel TS$ \angle^s in same segment \angle^e in dies. segment</p>	<p>✓ ST A ✓ RE A ✓ ST CA ✓ RE A (4)</p>
7.3	<p>$\hat{T}\hat{C}\hat{O} = 60^\circ$ Proven $\therefore \hat{B}\hat{C}\hat{A} = 30^\circ$ $\hat{B}\hat{C}\hat{A} \neq \hat{D}\hat{A}\hat{C}$ AD not // to BC Alt. $\angle^s \neq$ AD nie // aan BC Verw. $\angle^e \neq$ ABCD not a parallelogram. ABCD is nie 'n parallellogram nie. OR/OF</p> <p>$\hat{B}\hat{A}\hat{D} = 110^\circ$ $\hat{B}\hat{C}\hat{D} = 70^\circ$ $\therefore \hat{B}\hat{A}\hat{D} \neq \hat{B}\hat{C}\hat{D}$ ABCD not a parallelogram. ABCD is nie 'n parallellogram nie. Opp. angles not equal/Teenoorst. hoeke nie gelyk</p>	<p>Proven</p>	<p>✓ ST CA ✓ RE A</p> <p style="text-align: center;">OR/OF</p> <p>Proven/Bewys CA Proven/Bewys</p> <p>✓ ST CA ✓ RE A (2)</p>
			[14]

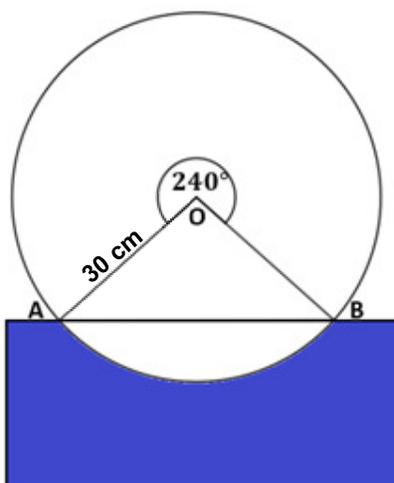
QUESTION/VRAAG 8			
8.1.1	Double (twice)/ <i>Dubbel (twee keer)</i>	✓ ST	A (1)
8.1.2	equal/gelyk	✓ ST	A (1)
8.1.3	supplementary/ <i>supplementêre</i>	✓ ST	A (1)
8.2.1	$\widehat{B}_1 = 40^\circ$ $\widehat{D}_2 = \widehat{B}_1 = 40^\circ$	tan-chord <i>raaklyn-koord</i> \angle^s opp. = sides \angle^e teenoor = sye	✓ ST/RE A ✓ ST/RE A (2)
8.2.2	$\widehat{C} = 180^\circ - 40^\circ - 40^\circ$ $\widehat{C} = 100^\circ$	Int. $\angle^s \Delta$ <i>Binne $\angle^e \Delta$</i>	✓ ST A (1)
8.2.3	$\widehat{A} = 180^\circ - 100^\circ$ $\widehat{A} = 80^\circ$	Opp. \angle^s cyclic quad <i>Teenoorst. \angle^e kdvh.</i>	✓ ST CA (1)
8.2.4	$\widehat{O}_1 = 2 \times 80^\circ$ $\widehat{O}_1 = 160^\circ$	\angle centre = $2 \times \angle$ circ. <i>mdpt. $\angle = 2 \times$ omtr. \angle</i>	✓ ST ✓ RE CA A (2)
			[9]

QUESTION/VRAAG 9			
9.1	proportion/ <i>eweredig</i>	✓ ST	A (1)
9.2			
9.2.1	$\frac{QS}{SP} = \frac{2}{5}$ $\frac{QS}{10} = \frac{2}{5}$ $QS = \frac{20}{5}$ $QS = 4 \text{ cm}$	✓ Ratio ✓ SF 10 ✓ S ✓ $QS = 4$	A A CA CA (4)

9.2.2	$\frac{SR}{SQ} = \frac{PS}{RS}$ $\Delta PSR // \Delta RSQ$ $RS^2 = SQ \times PS$ $RS = \sqrt{4 \times 10}$ $RS = \sqrt{40}$ $RS = 6,32 \text{ cm}$	\checkmark ST \checkmark S \checkmark SF \checkmark S \checkmark 6,32 ($\sqrt{40}$)	A CA CA CA CA (5)
9.2.3	In ΔPSR $(PR)^2 = (RS)^2 + (PS)^2$ $(PR)^2 = (\sqrt{40})^2 + (10)^2$ $PR = \sqrt{40 + 100}$ $PR = \sqrt{140}$ $PR = 11,83 \text{ cm}$	\checkmark F \checkmark SF \checkmark 11,83 ($\sqrt{140}$)	A CA CA (3)
9.2.4	In ΔPRQ $\frac{PT}{PR} = \frac{PS}{QS}$ Proportionality; $ST \parallel QR$ <i>Eweredigheid; $ST \parallel QR$</i> $\frac{PT}{PR} = \frac{5}{7}$ $PT = \frac{5}{7} \times PR$ $PT = \frac{5}{7} \times \sqrt{140}$ $PT = 8,45 \text{ cm}$	\checkmark ST \checkmark SF \checkmark 8,45 ($\frac{10\sqrt{35}}{7}$)	A CA CA (3)
			[16]

QUESTION/VRAAG 10			
10.1			
			
10.1.1	$n = \frac{150}{60} = 2,5r/s$ $D = \frac{2 \times 22,86}{100} = 0,4572m$ $v = \pi Dn$ $v = \pi(0,4572)(2,5)$ $v = 3,59 m/s$	✓ Both/Beide C ✓ F ✓ SF ✓ 3,59	A A CA CA (4)
10.1.2	$\omega = 2\pi n$ $\omega = 2\pi(2,5)$ $\omega = 15,71 \text{ rad/s}$	✓ F ✓ SF ✓ 15,71	A CA CA (3)
10.2	$4h^2 - 4dh + x^2 = 0$ $4h^2 - 4(2 \times 22,86)h + (20)^2 = 0$ $4h^2 - 182,88h + 400 = 0$ $h = \frac{-(-182,88) \pm \sqrt{(-182,88)^2 - 4(4)(400)}}{2(4)}$ $h = 43,42 \quad \text{or/of} \quad h = 2,30$ $\therefore h = 2,30 \text{ cm}$ <p style="text-align: center;">OR/OF</p> $OM^2 = OR^2 - MR^2$ $OM^2 = (22,86)^2 - (10)^2$ $OM^2 = 422,5 \dots$ $OM = 20,55 \dots$ $h \text{ (BM)} = 22,86 - 20,55 \dots$ $h \text{ (BM)} = 2,30 \text{ cm}$	✓ F ✓ SF ✓ M ✓ 2,30 OR/OF ✓ SF ✓ 20,55 ✓ M ✓ 2,30	A A CA CA A CA (4)

10.3



10.3.1	$\widehat{AOB} = 360^\circ - 240^\circ = 120^\circ$	✓ 120°	A (1)
10.3.2	$\widehat{AOB} = 120^\circ \times \frac{\pi}{180^\circ}$ $\widehat{AOB} = \frac{2}{3}\pi$ $\widehat{AOB} = 6,58 \text{ rad}$	✓ M ✓ 6,58	A CA (2)
10.3.3	$s = r\theta$ $s = (30) \left(\frac{2}{3}\pi\right)$ $s = 20\pi$ $s = 62,83 \text{ cm}$	✓ F ✓ SF ✓ 62,83	A CA CA (3)
10.3.4	$\text{Area}_{\text{sector/sector}} = \frac{r \cdot s}{2}$ $\text{Area}_{\text{sector/sector}} = \frac{(30) \cdot (20\pi)}{2}$ $\text{Area}_{\text{sector/sector}} = 300\pi = 942,48 \text{ cm}^2$ $A_{\Delta} = \frac{1}{2} (30)(30) \sin 120^\circ$ $A_{\Delta} = 389,71 \text{ cm}^2$ $A = 700 - (942,48 - 389,71)$ $A = 147,23 \text{ cm}^2$	✓ SF ✓ 942,48 ✓ 389,71 ✓ M ✓ 147,23	CA CA CA A CA (5)
			[22]

QUESTION/VRAAG 11		
11.1.1	DO NOT MARK / MOET NIE MERK NIE.	
11.1.2	DO NOT MARK / MOET NIE MERK NIE.	
11.1.3	DO NOT MARK / MOET NIE MERK NIE.	
11.1.4	DO NOT MARK / MOET NIE MERK NIE.	
11.2	$\text{Area} = a \left(\frac{O_1 + O_n}{2} + O_2 + O_3 + \dots + O_{n-1} \right)$ $\text{Area} = 80 \left(\frac{26 + 78}{2} + 52 + 143 + 290 + 182 \right)$ $\text{Area} = 80(719)$ $\text{Area} = 57\,520 \text{ mm}^2$ <p style="text-align: center;">OR/OF</p> $A = a \left(\frac{O_1+O_2}{2} + \frac{O_2+O_3}{2} + \frac{O_3+O_4}{2} + \frac{O_4+O_5}{2} + \frac{O_5+O_6}{2} \right)$ $A = 80 \left(\frac{26+52}{2} + \frac{52+143}{2} + \frac{143+290}{2} + \frac{290+182}{2} + \frac{182+78}{2} \right)$ $A = 80(719)$ $A = 57\,520 \text{ mm}^2$	<p>✓ F A</p> <p>✓ SF A</p> <p>✓ 57 520 CA</p> <p style="text-align: center;">OR/OF</p> <p>✓ F A</p> <p>✓ SF A</p> <p>✓ 57 520 CA</p> <p style="text-align: right;">(3)</p>
		[3]
TOTAL/TOTAAL:		141