



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE/
*NASIONALE
SENIOR SERTIFIKAAT***

GRADE/*GRAAD* 12

JUNE/*JUNIE* 2019

**MATHEMATICS P2/*WISKUNDE V2*
MARKING GUIDELINE/*NASIENRIGLYN***

MARKS/*PUNTE*: 150

This marking guideline consists of 17 pages./
Hierdie nasienriglyn bestaan uit 17 bladsye.

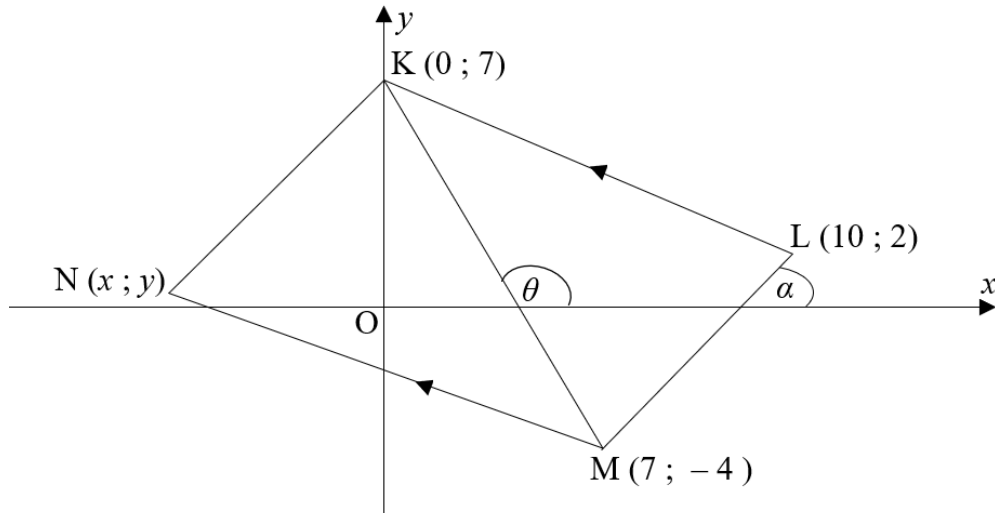
QUESTION 1/VRAAG 1

1.1	Mean/ <i>Gemiddelde</i> = 48	✓ 48 (1)
1.2	SD/SA = 22,08 Penalty of 1 mark for incorrect rounding <i>Penaliseer 1 punt vir verkeerde afronding</i>	✓✓ 22,08 (2)
1.3	Girls performed better. The girls' mean percentage is bigger than that of boys and the girls standard deviation is smaller than that of boys <i>Meisies het beter gevaar. Die meisies se gemiddelde persentasie is groter as dié van die seuns en die standaardafwyking is kleiner as dié van die seuns.</i>	✓ Girls / <i>Meisies</i> ✓ Reason / <i>Rede</i> (2)
1.4	$51 - 48 = 3$ ∴ each boy's percentage must be increased by 3. <i>∴ elke seun se persentasie moet met 3 vermeerder word.</i>	✓ 3 (1)
1.5	Boys' standard deviation will remain the same <i>Die seuns se standaardafwyking sal dieselfde bly.</i>	✓ remain the same <i>dieselfde bly</i> (1)
		[7]

QUESTION 2/VRAAG 2

2.1	<table border="1"> <thead> <tr> <th>Ages (in years) <i>Ouderdom (in jare)</i></th> <th>Frequency <i>Frekwensie</i></th> <th>Cumulative Frequency <i>Kumulatiewe Frekwensie</i></th> </tr> </thead> <tbody> <tr> <td>$18 \leq x < 28$</td> <td>4</td> <td>4</td> </tr> <tr> <td>$28 \leq x < 38$</td> <td>10</td> <td>14</td> </tr> <tr> <td>$38 \leq x < 48$</td> <td>14</td> <td>28</td> </tr> <tr> <td>$48 \leq x < 58$</td> <td>17</td> <td>45</td> </tr> <tr> <td>$58 \leq x < 68$</td> <td>12</td> <td>57</td> </tr> <tr> <td>$68 \leq x < 78$</td> <td>3</td> <td>60</td> </tr> </tbody> </table>	Ages (in years) <i>Ouderdom (in jare)</i>	Frequency <i>Frekwensie</i>	Cumulative Frequency <i>Kumulatiewe Frekwensie</i>	$18 \leq x < 28$	4	4	$28 \leq x < 38$	10	14	$38 \leq x < 48$	14	28	$48 \leq x < 58$	17	45	$58 \leq x < 68$	12	57	$68 \leq x < 78$	3	60	<p>✓ frequency <i>frekwensie</i></p> <p>✓ cumulative frequency <i>kumulatiewe frekwensie</i></p> <p>(2)</p>
Ages (in years) <i>Ouderdom (in jare)</i>	Frequency <i>Frekwensie</i>	Cumulative Frequency <i>Kumulatiewe Frekwensie</i>																					
$18 \leq x < 28$	4	4																					
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$38 \leq x < 48$	14	28																					
$48 \leq x < 58$	17	45																					
$58 \leq x < 68$	12	57																					
$68 \leq x < 78$	3	60																					
2.2	<p style="text-align: center;">Ogive - Ages of people registering to vote Ogief - Ouderdomme van mense wat registreer om te stem</p>	<p>✓ grounding at / <i>anker by (0 ; 18)</i></p> <p>✓ upper limits <i>boonste limiete</i></p> <p>✓ shape / <i>vorm</i></p> <p>(3)</p>																					
2.3	$48 \leq x < 58$	<p>✓ answer / <i>antwoord</i></p> <p>(1)</p>																					
2.4	$60 - 49 = 11$ senior citizens / <i>senior burgers</i>	<p>✓ 49</p> <p>✓ answer / <i>antwoord</i></p> <p>(2)</p>																					
2.5	$Q_1 = 39$ $Q_2 = 50$ $Q_3 = 58$	<p>✓ value of / <i>waarde van</i> Q_1</p> <p>✓ value of / <i>waarde van</i> Q_2</p> <p>✓ value of / <i>waarde van</i> Q_3</p> <p>(3)</p>																					
2.6		<p>✓ minimum and maximum <i>minimum en maksimum</i></p> <p>✓ box / <i>boks</i></p> <p>(2)</p>																					
		[13]																					

QUESTION 3/VRAAG 3

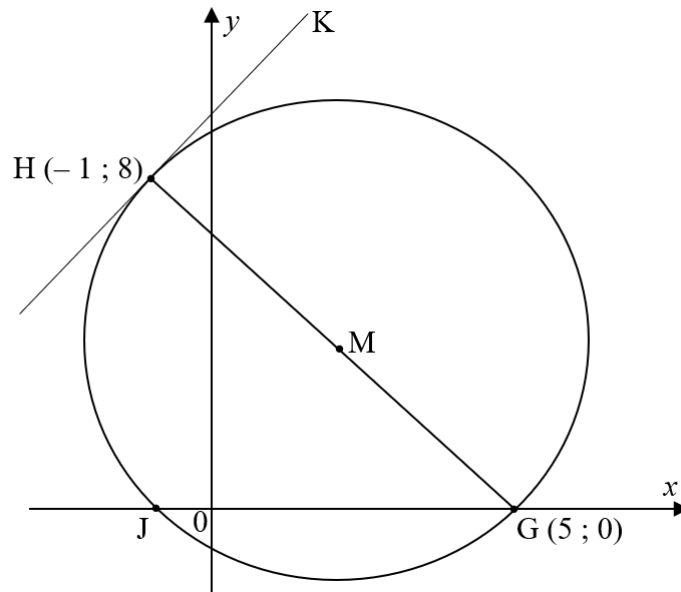


3.1.1	$KL = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(10 - 0)^2 + (2 - 7)^2}$ $= \sqrt{125} = 5\sqrt{5}$	✓ substitution / <i>vervanging</i> ✓ answer / <i>antwoord</i> (2)
3.1.2	$m_{KM} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{-4 - 7}{7 - 0}$ $= -\frac{11}{7}$	✓ substitution / <i>vervanging</i> ✓ gradient of KM / <i>gradiënt van KM</i> (2)
3.1.3	$m_{LM} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{-4 - 2}{7 - 10}$ $= 2$ $\tan \alpha = 2$ $\therefore \alpha = 63,43^\circ$	✓ gradient of LM / <i>gradiënt van LM</i> ✓ $\tan \alpha = 2$ ✓ value of α / <i>waarde van α</i> (3)
3.1.4	$\tan \theta = -\frac{11}{7}$ $\text{Ref } \angle = 57,53^\circ$ $\therefore \theta = 122,47^\circ$ $\hat{\text{LMK}} = 122,47^\circ - 63,43^\circ$ $= 59,04^\circ$	✓ $\tan \theta = -\frac{11}{7}$ ✓ reference angle / <i>verwysingshoek</i> ✓ value of θ / <i>waarde van θ</i> ✓ value of $\hat{\text{LMK}}$ / <i>waarde van $\hat{\text{LMK}}$</i> (4)

<p>3.2</p> $m_{KN} = m_{LM}$ $\frac{y-7}{x-0} = 2$ $y = 2x+7$ $m_{MN} = m_{KL}$ $\frac{y+4}{x-7} = -\frac{1}{2}$ $y = -\frac{x}{2} - \frac{1}{2}$ $2x+7 = -\frac{x}{2} - \frac{1}{2}$ $\therefore y = -\frac{x}{2} + \frac{13}{2}$ $4x+14 = -x-1$ $x = -3$ $y = 1$ <p style="text-align: center;">OR / OF</p> $m_{KL} = \frac{-5}{10}$ $m_{NM} = \frac{-5}{10}$ <p>Hence the coordinates of/ <i>Vervolgens die koördinate van N(-3;1)</i></p> <p style="text-align: center;">OR/OF</p> <p>Midpoint of KM / <i>Middelpunt van KM</i> = $\left(\frac{7}{2}, \frac{3}{2}\right)$</p> <p>Midpoint of LN / <i>Middelpunt van LN</i> = $\left(\frac{7}{2}, \frac{3}{2}\right)$</p> $\therefore \frac{x+10}{2} = \frac{7}{2} \text{ and/en } \frac{y+2}{2} = \frac{3}{2}$ $\therefore N(-3;1)$	<p>✓ $y = 2x+7$</p> <p>✓ $y = -\frac{x}{2} - \frac{1}{2}$</p> <p>✓ value of x / <i>waarde van x</i></p> <p>✓ value of y / <i>waarde van y</i></p> <p style="text-align: center;">OR/OF</p> <p>✓ $m_{KL} = \frac{-5}{10}$</p> <p>✓ $m_{NM} = \frac{-5}{10}$</p> <p>✓ value of x / <i>waarde van x</i></p> <p>✓ value of y / <i>waarde van y</i></p> <p style="text-align: center;">OR/OF</p> <p>✓ Midpoint of KM / <i>Middelpunt van KM</i> = $\left(\frac{7}{2}, \frac{3}{2}\right)$</p> <p>✓ Midpoint of LN / <i>Middelpunt van LN</i> = $\left(\frac{7}{2}, \frac{3}{2}\right)$</p> <p>✓ value of x / <i>waarde van x</i></p> <p>✓ value of y / <i>waarde van y</i></p> <p style="text-align: right;">(4)</p>
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3.3	$m_{LM} \times m_{MN} = 2 \times \left(-\frac{1}{2}\right)$ $= -1$ $\therefore \hat{LMN} = 90^\circ$ <p>OR/OF \hat{LMN} is a right angle / is 'n regtehoek</p>	<p>✓ product of gradients / produk van gradiënte</p> <p>✓ conclusion / gevolgtrekking</p> <p style="text-align: right;">(2)</p>
3.4	$KL = NM = 5\sqrt{5}$ $KM = \sqrt{7^2 + 11^2}$ $= \sqrt{170}$ $\hat{LMN} = 90^\circ \text{ and / en } \hat{LMK} = 59,04^\circ$ $\therefore \hat{KMN} = 90^\circ - 59,04^\circ = 30,96^\circ$ $\text{Area of } \Delta KMN = \frac{1}{2} \times \sqrt{170} \times 5\sqrt{5} \times \sin 30,96^\circ$ $= 37,50 \text{ square units / vierkante eenhede}$	<p>✓ $KL = NM = 5\sqrt{5}$</p> <p>✓ $KM = \sqrt{170}$</p> <p>✓ $\hat{LMN} = 90^\circ$ and / en $\hat{LMK} = 59,04^\circ$</p> <p>✓ $\hat{KMN} = 30,96^\circ$</p> <p>✓ Area of ΔKMN</p> <p style="text-align: right;">(5)</p>
		[22]

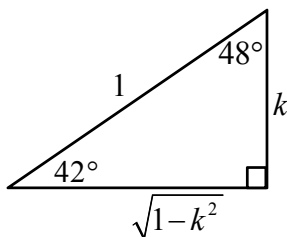
QUESTION 4/VRAAG 4

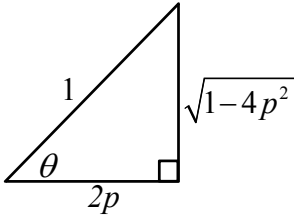


4.1	$M(2; 4)$	✓ value of x / waarde van x ✓ value of y / waarde van y	(2)
4.2	$r^2 = (5-2)^2 + (0-4)^2$ $= 25$ $\therefore (x-2)^2 + (y-4)^2 = 25$	✓ $(x-2)^2$ ✓ $(y-4)^2$ ✓ 25	(3)
4.3	$m_{GH} = \frac{8-0}{-1-5}$ $= -\frac{8}{6} = -\frac{4}{3}$ $m_{\text{tan}} = \frac{3}{4}$ $y-8 = \frac{3}{4}(x+1)$ $\therefore y = \frac{3}{4}x + \frac{35}{4}$	✓ m_{GH} ✓ m_{tan} ✓ substitution / vervanging ✓ equation / vergelyking	(4)
4.4	At/By J, $y=0$ $(x-2)^2 + (0-4)^2 = 25$ $(x-2)^2 = 9$ $x-2 = \pm 3$ $x=5$ or/of $x=-1$ $\therefore J(-1; 0)$	✓ $y=0$ ✓ substitution / vervanging ✓ $x=-1$	(3)

4.5	<p>HJG is a right angled triangle (8, 6 and 10). So the rotation of J around M will complete a rectangle Hence, $j((-1 + 6; 0 + 8)) = J^l(5; 8)$</p> <p><i>HJG is 'n reghoekige driehoek (8, 6 en 10)</i> <i>Dus sal die rotasie van J om M die reghoek voltooi.</i> <i>Vervolgens is $J^l((-1 + 6; 0 + 8)) = J^l(5; 8)$</i></p>	<p>✓ value of x / <i>waarde van x</i> ✓ value of y / <i>waarde van y</i></p> <p style="text-align: right;">(2)</p>
4.6	<p>$x^2 + y^2 - 12x - 2y + 17 = 0$ $x^2 - 12x + y^2 - 2y = -17$ $x^2 - 12x + 36 + y^2 - 2y + 1 = -17 + 36 + 1$ $(x - 6)^2 + (y - 1)^2 = 20$</p> <p>Distance between the centres: <i>Afstand tussen die middelpunte:</i></p> <p>$\sqrt{(2 - 6)^2 + (4 - 1)^2} = 5$</p> <p>$\therefore$ the centre lies on the original circle / <i>die middelpunt lê op die omtrek van die oorspronklike sirkel</i></p>	<p>✓ completing the square / <i>voltooiing van die vierkant</i></p> <p>✓ factorisation/<i>faktorisering: x</i> ✓ factorisation/<i>faktorisering: y</i></p> <p>✓ distance formula / <i>afstand formule</i></p> <p>✓ conclusion / <i>gevolgtrekking</i></p> <p style="text-align: right;">(5)</p>
		[19]

QUESTION 5/VRAAG 5

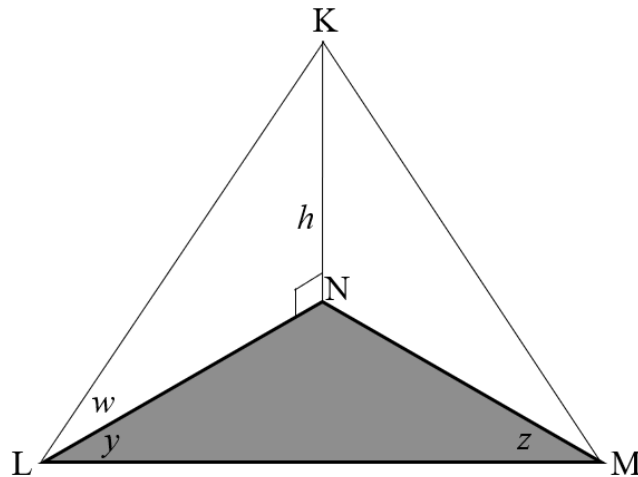
<p>5.1.1</p>	$\sin 42^\circ = \frac{k}{1}$ $\tan 42^\circ = \frac{k}{\sqrt{1-k^2}}$ 	$\checkmark \sqrt{1-k^2}$ $\checkmark \tan 42^\circ = \frac{k}{\sqrt{1-k^2}}$ <p style="text-align: right;">(2)</p>
<p>5.1.2</p>	$\sin 84^\circ = \sin 2 \times 42^\circ$ $= 2 \sin 42^\circ \cos 42^\circ$ $= 2 \cdot k \cdot \sqrt{1-k^2} = 2k \sqrt{1-k^2}$	$\checkmark \text{double angle/dubbelhoek}$ $\checkmark \text{expansion/identiteit/ontwikkeling}$ $\checkmark \text{substitution/vervang}$ <p style="text-align: right;">(3)</p>
<p>5.1.3</p>	$\sin 3^\circ = \sin(45^\circ - 42^\circ)$ $= \sin 45^\circ \cos 42^\circ - \cos 45^\circ \sin 42^\circ$ $= \frac{\sqrt{2}}{2} \cdot \sqrt{1-k^2} - \frac{\sqrt{2}}{2} \cdot k$	$\checkmark 3^\circ = 45^\circ - 42^\circ$ $\checkmark \text{expansion/identiteit/ontwikkeling}$ $\checkmark \text{substitution/vervang}$ $\checkmark \text{substitution/vervang}$ <p style="text-align: right;">(4)</p>
<p>5.2</p>	$\frac{\sin(x-45^\circ) \cdot \tan(180^\circ+x) \cdot \sin(90^\circ-x)}{\cos(-x)}$ $\frac{-\cos x \cdot \tan x \cdot \cos x}{\cos x}$ $-\cos x \cdot \frac{\sin x}{\cos x}$ $-\sin x$	$\checkmark -\cos x$ $\checkmark \tan x$ $\checkmark \cos x$ $\checkmark \cos x$ $\checkmark \frac{\sin x}{\cos x}$ $\checkmark \text{answer / antwoord}$ <p style="text-align: right;">(6)</p>
<p>5.3.1</p>	$\cos(A+B) = \cos A \cos B - \sin A \sin B$	$\checkmark \text{expansion/identiteit/ontwikkeling}$ <p style="text-align: right;">(1)</p>
<p>5.3.2</p>	$\text{LHS/LK} = \cos 3\alpha$ $= \cos(2\alpha + \alpha)$ $= \cos 2\alpha \cos \alpha - \sin 2\alpha \sin \alpha$ $= (2 \cos^2 \alpha - 1) \cdot \cos \alpha - 2 \sin \alpha \cos \alpha \cdot \sin \alpha$ $= 2 \cos^3 \alpha - \cos \alpha - 2 \sin^2 \alpha \cos \alpha$ $= 2 \cos^3 \alpha - \cos \alpha - 2(1 - \cos^2 \alpha) \cos \alpha$ $= 2 \cos^3 \alpha - \cos \alpha - 2 \cos \alpha + 2 \cos^3 \alpha$ $= 4 \cos^3 \alpha - 3 \cos \alpha$ $= \text{RHS/RK}$	$\checkmark \text{compound angle identity}$ $\text{saamgesteldehoek-identiteit}$ $\checkmark \text{cos double angle identity}$ $\text{cos dubbelhoek-identiteit}$ $\checkmark \text{sin double angle identity}$ $\text{sin dubbelhoek-identiteit}$ $\checkmark (1 - \cos^2 \alpha)$ <p style="text-align: right;">(4)</p>

5.4	$\cos \theta = \frac{2p}{1}$  $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$ $7p = (2p)^2 - (\sqrt{1-4p^2})^2$ $7p = 4p^2 - 1 + 4p^2$ $8p^2 - 7p - 1 = 0$ $(8p+1)(p-1) = 0$ $\therefore p = -\frac{1}{8} \text{ or / of } p = 1$ <p style="text-align: center;">OR/OF</p> $\cos 2\theta = 2\cos^2 \theta - 1$ $7p = 2 \cdot (2p)^2 - 1$ $7p = 8p^2 - 1$ $8p^2 - 7p - 1 = 0$ $(8p+1)(p-1) = 0$ $\therefore p = -\frac{1}{8} \text{ or / of } p = 1$ <p style="text-align: center;">OR/OF</p> $\cos 2\theta = 1 - 2\sin^2 \theta$ $7p = 1 - 2 \cdot (\sqrt{1-4p^2})^2$ $7p = 1 - 2(1 - 4p^2)$ $7p = 1 - 2 + 8p^2$ $8p^2 - 7p - 1 = 0$ $(8p+1)(p-1) = 0$ $\therefore p = -\frac{1}{8} \text{ or / of } p = 1$	$\checkmark \sqrt{1-4p^2}$ $\checkmark \cos 2\theta = \cos^2 \theta - \sin^2 \theta$ \checkmark substitution/ <i>vervanging</i> \checkmark standard form <i>standaardvorm</i> \checkmark values of p / <i>waardes van p</i> <p style="text-align: center;">OR/OF</p> $\checkmark 2\cos^2 \theta - 1$ $\checkmark \checkmark$ substitution/ <i>vervanging</i> \checkmark standard form / <i>standaardvorm</i> \checkmark values of p / <i>waardes van p</i> <p style="text-align: center;">OR/OF</p> $\checkmark \sqrt{1-4p^2}$ $\checkmark 1 - 2\sin^2 \theta$ \checkmark substitution / <i>vervanging</i> \checkmark standard form <i>standaardvorm</i> \checkmark values of p / <i>waardes van p</i> <p style="text-align: right;">(5)</p> <p style="text-align: right;">[25]</p>
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QUESTION 6/VRAAG 6

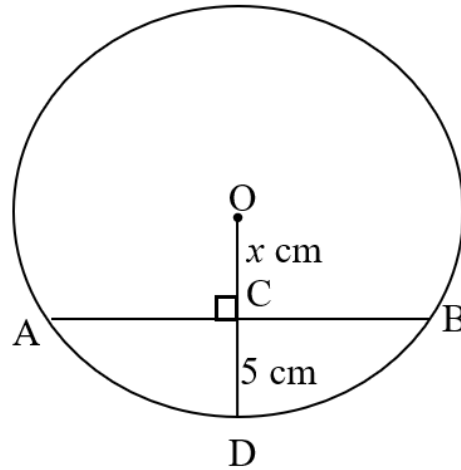
6.1	$y \in [-1; 1]$ OR/OF $-1 \leq y \leq 1$	✓ answer / <i>antwoord</i> (1)
6.2		<i>g</i> : ✓ asymptotes at -90° and 90° <i>asymptote vir -90° en 90°</i> ✓ <i>x</i> -intercepts <i>x-afsnitte</i> ✓ shape / <i>vorm</i> (3)
6.3	180°	✓ 180° (1)
6.4	$x = -45^\circ$	✓ -45° (1)
6.5	$x \in [45^\circ; 90^\circ)$ OR/OF $45^\circ \leq x < 90^\circ$	✓ critical values <i>kritiese waardes</i> ✓ notation / <i>notasie</i> (2)
6.6	$h(x) = \sin(x - 45^\circ) + 1$	✓ $h(x) = \sin(x - 45^\circ) + 1$ (1)
		[9]

QUESTION 7/VRAAG 7



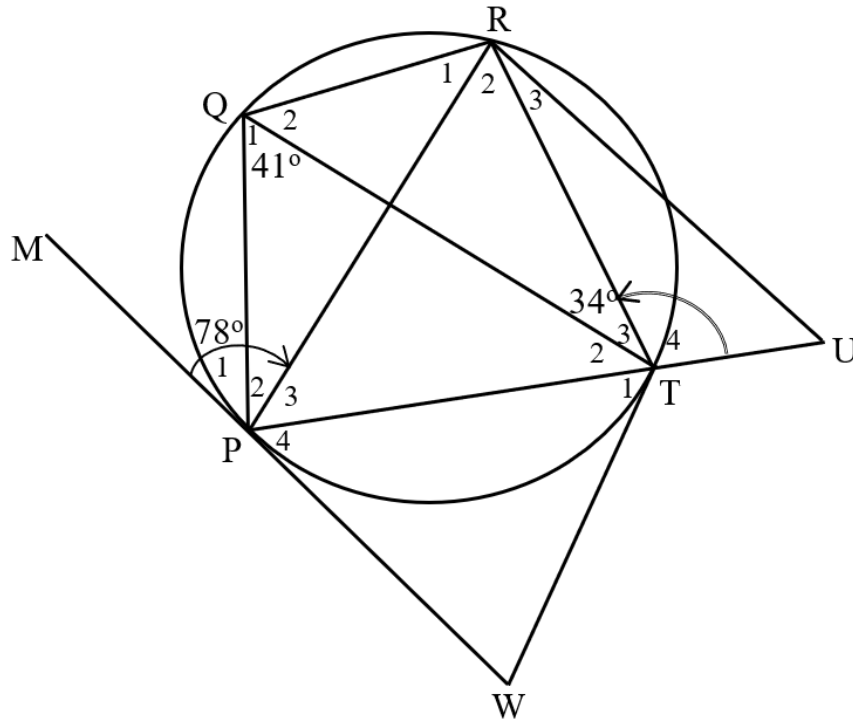
7.1	<p>In $\triangle KLN$:</p> $\tan w = \frac{h}{LN}$ $LN = \frac{h}{\tan w}$	<p>✓ $LN = \frac{h}{\tan w}$</p> <p>(1)</p>
7.2	<p>In $\triangle NLM$</p> $\frac{LM}{\sin \hat{N}} = \frac{LN}{\sin \hat{M}}$ $\frac{LM}{\sin (180^\circ - (y+z))} = \frac{LN}{\sin z}$ $\therefore LM = \frac{LN \cdot \sin (y+z)}{\sin z}$ <p>But $LN = \frac{h}{\tan w}$</p> $\therefore LM = \frac{h \sin (y+z)}{\tan w \sin z}$	<p>✓ correct sine rule <i>korrekte sinusreël</i></p> <p>✓ substitution <i>vervanging</i></p> <p>✓ isolating LM <i>isoleer LM</i></p> <p>✓ answer / <i>antwoord</i></p> <p>(4)</p>
7.3	<p>$LM = \frac{h \sin (y+z)}{\tan w \sin z}$ and/en</p> <p>$h = 38 \text{ m}$, $w = 21^\circ$, $y = 52^\circ$ and/en $z = 59^\circ$</p> $\therefore LM = \frac{38 \cdot \sin (52^\circ + 59^\circ)}{\tan 21^\circ \sin 59^\circ}$ $= 107,82 \text{ m}$	<p>✓ substitution <i>vervanging</i></p> <p>✓ answer / <i>antwoord</i></p> <p>(2)</p>
		[7]

QUESTION 8/VRAAG 8



8.1	the centre of a circle / <i>die middelpunt van die sirkel</i>	✓ answer / <i>antwoord</i> (1)
8.2.1	AC = 10 cm (line from centre \perp chord) (<i>lyn vanaf die middelpunt \perp op koord</i>)	✓ length of AC <i>lengte van AC</i> ✓ Reason/ <i>rede</i> (2)
8.2.2	$(x+5)^2 = 10^2 + x^2$ $x^2 + 10x + 25 = 100 + x^2$ $10x = 75$ $\therefore x = 7,5 \text{ cm}$ $\therefore \text{radius} = 7,5 \text{ cm} + 5 \text{ cm}$ $= 12,5 \text{ cm}$	✓ radius = $(x + 5)$ ✓ applying Pythagoras theorem / <i>toepassing van Pythagoras se stelling</i> ✓ value of x / <i>waarde van x</i> ✓ length of radius / <i>lengte van radius</i> (4)
		[7]

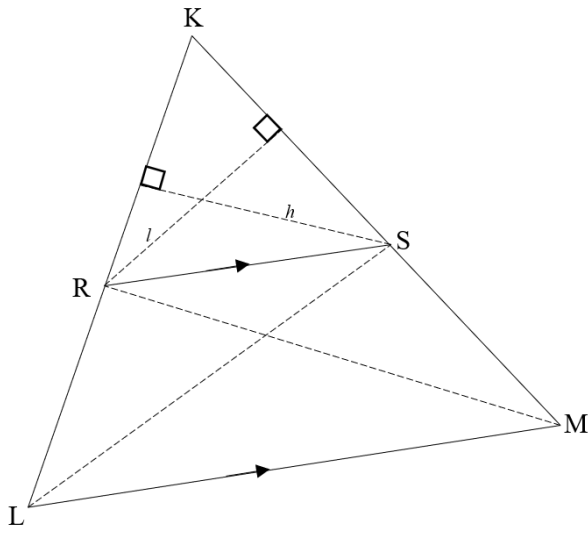
QUESTION 9/VRAAG 9



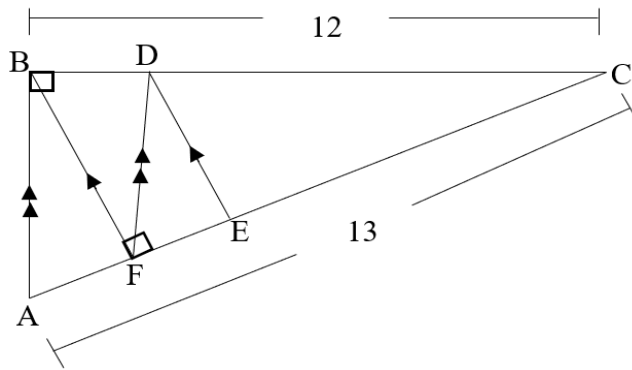
9.1	interior opposite angle / teenoorstaande binnehoek	✓ answer / antwoord (1)
9.2.1	$\hat{R}_2 = \hat{Q}_2 = 41^\circ$ (\angle s in the same seg)/(\angle e in dieselfde seg.) $\hat{P}_4 = \hat{Q}_1 = 41^\circ$ (tan-chord theorem)/(raaklyn-koord stelling) $\hat{T}_1 = \hat{P}_4 = 41^\circ$ (\angle s opp. = sides)/(\angle e teenoor gelyke sye) OR/OF $\hat{T}_1 = \hat{R}_2 = 41^\circ$ (tan – chord theorem)/(raaklyn-koord stelling)	✓ Statement / bewering ✓ Reason / rede ✓ Statement / bewering ✓ Reason / rede ✓ Statement / bewering ✓ Reason / rede (6)
9.2.2(a)	$\hat{T}_2 + 34^\circ = 78^\circ$ (tan – chord theorem)/(raaklyn-koord stelling) $\therefore \hat{T}_2 = 44^\circ$	✓ Statement / bewering ✓ Reason / rede (2)
9.2.2(b)	$41^\circ + \hat{Q}_2 + 44^\circ + 34^\circ = 180^\circ$ (opp. \angle s of a cyclic quad.) $\therefore \hat{Q}_2 = 61^\circ$ (teenoorst. \angle evan'n koordevierhoek)	✓ Statement / bewering ✓ Reason / rede (2)
9.2.2(c)	$\hat{T}_4 = 41^\circ + 61^\circ$ (ext. \angle s of a cyclic quad.) $\therefore \hat{T}_4 = 102^\circ$ (buite \angle van koordevierhoek) OR/OF $\hat{T}_4 + 44^\circ + 34^\circ = 180^\circ$ (int. \angle s of a Δ) $\therefore \hat{T}_4 = 102^\circ$ (binne \angle evan'n Δ)	✓ Statement / bewering ✓ Reason / rede OR/OF ✓ Statement / bewering ✓ Reason / rede (2)

9.2.2(d)	$\hat{W} + 41^\circ + 41^\circ = 180^\circ$ (int. \angle s of a Δ)/(binne \angle e van Δ) $\therefore \hat{W} = 98^\circ$	✓ Statement /bewering ✓ Reason / rede (2)
9.2.3(a)	$\hat{Q}_2 = 61^\circ$ and/en $\hat{T}_2 = 44^\circ$ $\therefore \hat{Q}_2 \neq \hat{T}_2$ \therefore QR is not parallel to PT (alt. \angle s are not equal) <i>QR is nie ewewydig aan PT nie (verw. \anglee is nie gelyk nie)</i>	✓ $\hat{Q}_2 \neq \hat{T}_2$ ✓ alt. \angle s are not equal <i>verw. \anglee is nie gelyk nie</i> (2)
9.2.3(b)	$\hat{R}_2 + \hat{W} = 41^\circ + 98^\circ$ $= 139^\circ \neq 180^\circ$ \therefore PRTW is not a cyclic quad. (Opp. \angle s are not supp.) <i>PRTW is nie 'n koordevierhoek nie</i> <i>(teenoorst. \anglee is nie supplementêr nie)</i>	✓ $\hat{R}_2 + \hat{W} \neq 180^\circ$ ✓ PRTW is not a cyclic quad. <i>PRTW is nie 'n koordevierhoek nie</i> (2)
9.2.3(c)	$\hat{R}_1 = \hat{T}_2 = 44^\circ$ (\angle s in same seg)/(\angle e in dieselfde segment) $\hat{R}_1 + \hat{R}_2 = 44^\circ + 41^\circ$ $= 95^\circ \neq 90^\circ$ \therefore TQ is not a diameter (\angle subt. by TQ is not a right angle) \therefore <i>TQ is nie 'n middellyn nie (Zonder span deur TQ is nie 'n reghoek nie)</i>	✓ $\hat{R}_1 + \hat{R}_2 \neq 90^\circ$ ✓ TQ is not a diameter <i>TQ is nie 'n middellyn nie</i> (2)
		[21]

QUESTION 10/VRAAG 10

10.1	 <p>Construction: Draw heights h and l on KR and KS respectively. Join LS and MR</p> <p>Konstruksie: Teken hoogtes h en l op KR en KS onderskeidelik. Verbind LS en MR</p> <p>Proof/Bewys:</p> $\frac{\text{Area of } \triangle KRS}{\text{Area of } \triangle LRS} = \frac{\frac{1}{2} \cdot KR \cdot h}{\frac{1}{2} \cdot RL \cdot h} = \frac{KR}{RL}$ $\frac{\text{Area of } \triangle KRS}{\text{Area of } \triangle MSR} = \frac{\frac{1}{2} \cdot KS \cdot l}{\frac{1}{2} \cdot SM \cdot l} = \frac{KS}{SM}$ <p>But/Maar: area of / van $\triangle LRS$ = area of / van $\triangle MSR$</p> $\frac{\text{Area of } \triangle KRS}{\text{Area of } \triangle LRS} = \frac{\text{Area of } \triangle KRS}{\text{Area of } \triangle MSR}$ $\therefore \frac{KR}{RL} = \frac{KS}{SM}$	<p>✓ construction / konstruksie</p> <p>✓ ratio of areas / verhouding van oppervlaktes</p> <p>✓ ratio of areas verhouding van oppervlaktes</p> <p>✓ same base and same height dieselfde basis en hoogte</p> <p>✓ $\frac{\text{Area of } \triangle KRS}{\text{Area of } \triangle LRS} = \frac{\text{Area of } \triangle KRS}{\text{Area of } \triangle MSR}$</p> <p>(5)</p>
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10.2



10.2.1	AB = 5 units	✓5 (1)
10.2.2(a)	\hat{C} is common / <i>is gemeen</i> $\hat{CBA} = \hat{CFB}$ (both/beide = 90°) $\hat{CAB} = \hat{CBF}$ (sum of \angle s of Δ)/(som van die \angle e van Δ) $\therefore \Delta CBA \parallel \Delta CFB$ (\angle, \angle, \angle)	✓ Statement/bewering/ Reason / rede ✓ Statement/bewering/ Reason / rede ✓ Reason/Rede (3)
10.2.2(b)	$\frac{CB}{CF} = \frac{CA}{CB}$ ($\parallel \Delta$ s) $CB^2 = CF \cdot CA$ $\therefore CF = \frac{CB^2}{CA}$	✓ proportion / verhouding ✓ reason / rede ✓ $CB^2 = CF \cdot CA$ (3)
10.2.3	$CF = \frac{CB^2}{CA}$ $CF = \frac{(12)^2}{13}$ ≈ 11 units/eenhede	✓ substitution / vervanging ✓ length of CF / lengte van CF (2)
10.2.4	AF = 13 – 11 = 2 units/eenhede	✓ length of AF / lengte van AF (1)
10.2.5	$\frac{CB}{BD} = \frac{CA}{AF}$ (prop. theorem/verh. stelling; $DF \parallel BA$) $\frac{12}{BD} = \frac{13}{2}$ $\therefore BD = \frac{24}{13}$ $\frac{CF}{FE} = \frac{CB}{BD}$ (prop. theorem/verh. stelling; $DF \parallel BA$) $\frac{11}{FE} = \frac{12}{\frac{24}{13}}$ $\therefore FE = \frac{22}{13}$ units/eenhede	✓ proportion / verhouding ✓ reason / rede ✓ length of BD / lengte van BD ✓ proportion / verhouding ✓ length of FE / lengte van FE (5)
		[20]
		TOTAL/TOTAAL: 150

