education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT/
PROVINSIALE ASSESSERING

GRADE/GRAAD 11

MATHEMATICS P2/*WISKUNDE V2*

NOVEMBER 2025

MARKING GUIDELINES/*NASIENRIGLYNE*

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MARKS/*PUNTE*: 150

These marking guidelines consist of 17 pages.
Hierdie nasienriglyne bestaan uit 17 bladsye.

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NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out an attempt of a question and not redone the question, mark the crossed out version.
- Consistent accuracy applies in ALL aspects of Marking Guidelines. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

LET WEL:

- *As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek en nie oordoen nie, sien die doodgetrekte poging na.*
- *Volgehoue akkuraatheid word in ALLE aspekte van 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 correct statement** **(A statement mark is indepenent 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

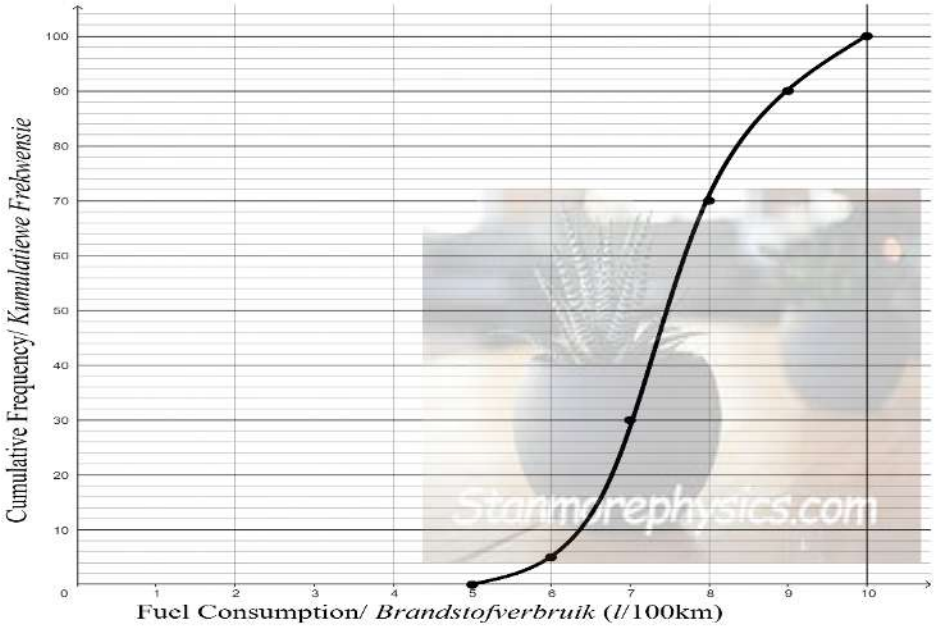
QUESTION/*VRAAG 1*

342	338	336	340	340	345	338	339	340	334
341	337	336	340	335	336	342	340	337	336

1.1	Mean/*Gemiddeld* $= \frac{6772}{20}$ $= 338{,}6$ answer only: full marks	✓ sum/*som* ✓ answer/*antwoord* (2)
1.2	$\sigma = 2{,}71$	✓ $\sigma = 2{,}71$ (1)
1.3	Interval = (338, 6 – 2,71; 338,8 + 2,71) = (335,89 ; 341,31) $\therefore \frac{15}{20} \times 100 = 75\%$ lies between 1 standard deviation. CA from 1.1 and 1.2	✓ interval ✓ 15 ✓ answer/*antwoord* (3)
1.4	The sample meets the requirements/*Die steekproef voldoen aan die vereistes.*	✓ answer/*antwoord* (1)
		[7]

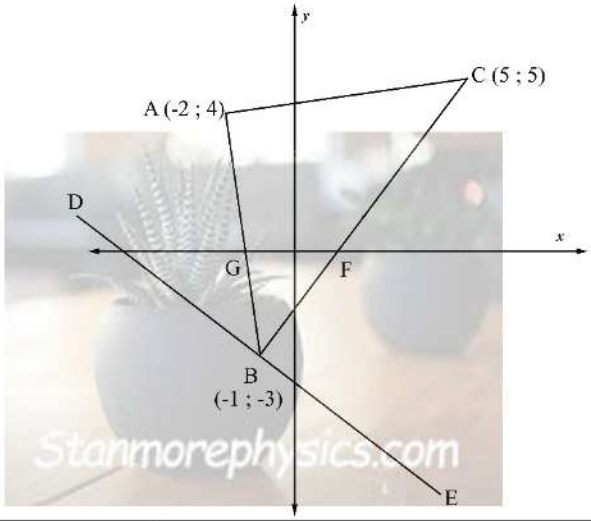
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QUESTION/*VRAAG 2*

<table>
<tr><td>2.1</td><td>100 cars/karre</td><td>✓ answer
(1)</td></tr>
<tr><td>2.2</td><td>$7 \leq x < 8$</td><td>✓ answer
(1)</td></tr>
<tr><td>2.3</td><td>
<table>
<tr><th>Interval</th><th>FREQUENCY
(number of vehicles)</th><th>CUMULATIVE
FREQUENCY</th></tr>
<tr><td>$5 \leq x < 6$</td><td>5</td><td>5</td></tr>
<tr><td>$6 \leq x < 7$</td><td>25</td><td>30</td></tr>
<tr><td>$7 \leq x < 8$</td><td>40</td><td>70</td></tr>
<tr><td>$8 \leq x < 9$</td><td>20</td><td>90</td></tr>
<tr><td>$9 \leq x < 10$</td><td>10</td><td>100</td></tr>
</table>
</td><td>✓5, 25, 40
✓20, & 10
✓Cumulative colom
(3)</td></tr>
<tr><td>2.4</td><td>
</td><td>✓ Grounding/grond (5;0)
✓ Using upper intervals/gebruik boonste intervalle
✓ End at/eindig by (10;100)
✓ shape/vorm
(4)</td></tr>
<tr><td>2.5</td><td>IQR/IKV = $Q_3 - Q_1$
$= 8{,}5 - 6{,}5$
$= 2$</td><td>✓$Q_3 = 8{,}5$
accept/aanvaar
(8-9)
✓$Q_1 = 6{,}5$
accept/aanvaar
(6-7)
✓ answer
(3)</td></tr>
<tr><td></td><td></td><td>[12]</td></tr>
</table>

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QUESTION/*VRAAG 3*



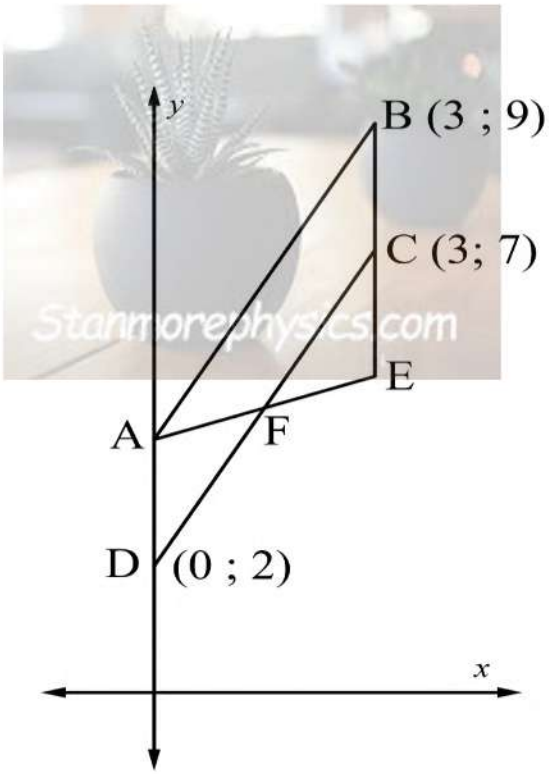
3.1	$d_{AC} = \sqrt{(5-(-2))^2 + (5-4)^2}$ $d_{AC} = \sqrt{50} = 5\sqrt{2} = 7.071$ answer only: full marks in any form	✓correct subst in distance formula/*korrekte vervanging in afstandsformule.* ✓answer/*antwoord* (2)
3.2	$m_{AB} = \frac{4-(-3)}{-2-(-1)}$ $m_{AB} = -7$ Swap: Max 1/2 $\frac{\Delta x}{\Delta y}$ B/D	✓correct substitution into gradient formula *korrekte vervanging in gradiënt formule* ✓ $m_{AB} = -7$ (2)
3.3	$m_{AC} = \frac{5-4}{5-(-2)}$ $m_{AC} = \frac{1}{7}$ $\frac{1}{7} \times -7$ $= -1$ $\therefore AB \perp AC$ and ΔABC is a right angle triangle	✓ $m_{AC} = \frac{1}{7}$ ✓ $m_{AC} \times m_{AB}$ ✓ -1 (3)
3.4	$m_{BC} = \frac{5-(-3)}{5-(-1)}$ $m_{BC} = \frac{4}{3}$ $\tan\beta = m_{BC} = \frac{4}{3}$ $\beta = 53{,}13°$	✓ $m_{BC} = \frac{4}{3}$ ✓ $\beta = 53{,}13°$

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	$\tan\theta = m_{AB}$ $\tan\theta = -7$ $\theta = 180° - 81{,}87°$ $\theta = 98{,}13°$ $A\hat{B}C = 98{,}13° - 53{,}13°$ [ext $\angle$ of Δ / *buite* $\angle$ *van* Δ] $A\hat{B}C = 45°$ $\therefore A\hat{B}E = 45° + 90° = 135°$ **OR/*OF*** AC = $5\sqrt{2}$ BC = 10 $sinA\hat{B}C = \frac{5\sqrt{2}}{10}$ $A\hat{B}C = sin^{-1}(\frac{5\sqrt{2}}{10})$ $A\hat{B}C = 45°$ $\therefore A\hat{B}E = 45° + 90° = 135°$	✓ $\theta = 98{,}13°$ ✓ $A\hat{B}C = 45°$ ✓ $A\hat{B}E = 135°$ (5) OR/*OF* ✓ BC = 10 ✓✓ $sinA\hat{B}C = \frac{5\sqrt{2}}{10}$ ✓ $A\hat{B}C = 45°$ ✓ $A\hat{B}E = 135°$ (5)
3.5	$m_{DE} = -\frac{3}{4}$ BC $\perp$ DE $y - y_1 = m(x - x_1)$ $y - (-3) = -\frac{3}{4}(x+1)$ $y + 3 = -\frac{3}{4}x - \frac{3}{4}$ $y = -\frac{3}{4}x - \frac{15}{4}$ **OR/OF** $y = -\frac{3}{4}x + c$ $-3 = -\frac{3}{4}(-1) + c$ $c = -\frac{15}{4}$ $y = -\frac{3}{4}x - \frac{15}{4}$	✓ $m_{DE} = -\frac{3}{4}$ ✓subst./*vervang* (-1 ; -3) ✓ $y = -\frac{3}{4}x - \frac{15}{4}$ (3)
3.6	$d_{AB} = \sqrt{(-1-(-2))^2 + (-3-4)^2}$ $d_{AB} = \sqrt{50}$ $d_{BC} = 5 \times 2 = 10$ $\therefore Area = \frac{1}{2}AB.BC.sinA\hat{B}E$ $= \frac{1}{2} \times \sqrt{50} \times 10 \times sin45°$ =25 units^2 OR $d_{AB} = \sqrt{(-1-(-2))^2 + (-3-4)^2}$ $d_{AB} = \sqrt{50}$ $\therefore Area = \frac{1}{2}AB.AC$ $= \frac{1}{2} \times \sqrt{50} \times \sqrt{50}$ =25 units^2	✓ $d_{AB} = \sqrt{50}$ ✓ $d_{BC} = 10$ ✓ $\frac{1}{2} \times \sqrt{50} \times 10 \times sin45°$ ✓answer/*antwoord* OR ✓ $d_{AB} = \sqrt{50}$ ✓ $Area = \frac{1}{2}AB.AC$ ✓ $\frac{1}{2} \times \sqrt{50} \times \sqrt{50}$ ✓answer/*antwoord* (4)
		[19]

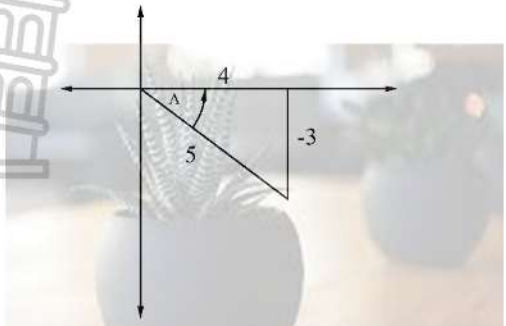
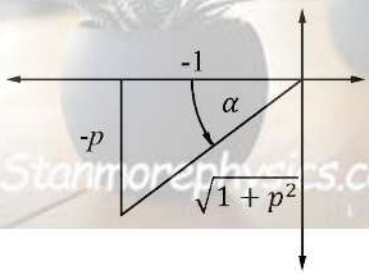
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QUESTION/*VRAAG 4*



4.1	A (0 ; 4)	✓answer/*antwoord* (1)
4.2	$x = 3$	✓ $x = 3$ (1)
4.3	Line through midpt ‖ to 2nd side . Accept : converse midpoint theorem/ *middelpuntstelling* **OR** ACED is parm...AD=CE & $AD \parallel CE$	✓reason/*rede* (1)
4.4	$F\left(\frac{0+3}{2};\frac{2+7)}{2}\right)$ F $(\frac{3}{2};\frac{9}{2})$	✓ $x = \frac{3}{2}$. ✓ $y = \frac{9}{2}$ (2)
4.5	$m_{OF} = \frac{\frac{9}{2}-0}{\frac{3}{2}-0} = 3$ $m_{BF} = \frac{9-\frac{9}{2}}{3-\frac{3}{2}} = 3$ $m_{OF} = m_{BF}$ and F is common/*gemeenskaplik*. ∴ O, F & B are collinear/*is kollinieêr*.	✓$m_{OF} = 3$ ✓ $m_{BF} = 3$ ✓ $m_{OF} = m_{BF}$ ✓ conclusion/*konklusie* **OR / *OF*** $m_{BO} = 3$ (4)
		[9]

QUESTION/*VRAAG 5*

5.1		
5.1.1	$x^2 = (5)^2 - (-3)^2$ $\therefore x = 4$ $cosA = \frac{4}{5}$ CA only if x is positive	✓ correct subst. ✓ $x = 4$ ✓ $cosA = \frac{4}{5}$ (3)
5.1.2	$\tan(A - 180°)$ $=tanA$ $=\frac{-3}{4}$ CA the answer if reduction is incorrect. CA from 5.1.1	✓$tanA$ ✓$\frac{-3}{4}$ (2)
5.2	$sin\alpha$ $= -\frac{p}{\sqrt{1+p^2}}$ CA the answer if $y = p$ 	✓ diagram ✓$r = \sqrt{1+p^2}$ ✓$-p$ ✓ answer (4)
5.3	$\frac{sin(-120°).tan330°}{\cos(360° - x)\sin(90° + x) + sin^2(180° + x)}$ $=\frac{(-sin\,60°).(-tan30°)}{(cosx.cosx)+sin^2x°}$ $=\frac{(-\frac{\sqrt{3}}{2})(-\frac{1}{\sqrt{3}})}{cos^2x+sin^2x}$ $=\frac{\frac{1}{2}}{1}$ $=\frac{1}{2}$	✓$(-sin\,60°)$ ✓ $(-tan30°)$ ✓$\cos(360° - x) = cosx$ ✓$\sin(90° + x) = cosx$ ✓sin^2x ✓$\left(-\frac{\sqrt{3}}{2}\right)\left(-\frac{1}{\sqrt{3}}\right)$ ✓$cos^2x + sin^2x = 1$ ✓answer/*antwoord*

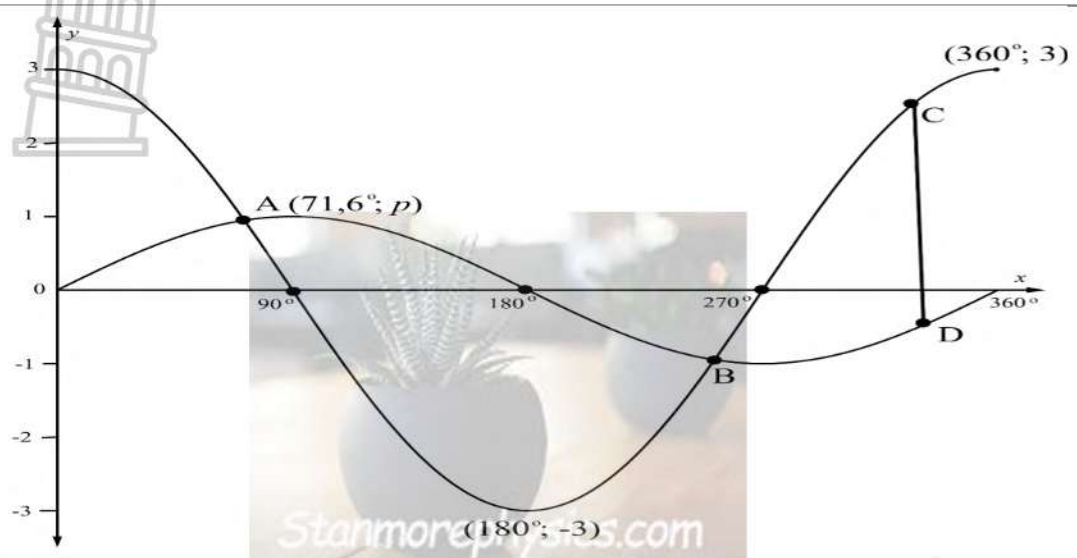
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		(8)
5.4	$\frac{(2-2sin^2x)(1+2tan^2x)}{1+sin^2x}=2$ LH: $\frac{(2-2sin^2x)(1+2tan^2x)}{1+sin^2x}$ $=\frac{2(1-sin^2x)\left(1+2(\frac{sin^2x}{cos^2x})\right)}{1+sin^2x}$ $=\frac{2(cos^2x)(1+2\left(\frac{sin^2x}{cos^2x}\right))}{1+sin^2x}$ $=\frac{2(cos^2x+2sin^2x)}{1+sin^2x}$ $=\frac{2(1-sin^2x+2sin^2x)}{1+sin^2x}$ $=\frac{2(1+sin^2x)}{1+sin^2x}$ =2 LH = RH	✓$tan^2x=\frac{sin^2x}{cos^2x}$ ✓ $2(1-sin^2x)$ ✓$1-sin^2x=cos^2x$ ✓$2(cos^2x+2sin^2x$ ✓$cos^2x=1-sin^2x$ ✓$1+sin^2x$ (6)
5.5	$2sin\theta+3cos\theta=0$ $2sin\theta=-3cos\theta$ $\frac{2sin\theta}{2cos\theta}=\frac{-3cos\theta}{2cos\theta}$ $tan\theta=-\frac{3}{2}$ $RA=56{,}31°$ *II* $\theta=180°-56{,}31°+k.180°, k\in Z$ $\theta=123{,}69°+k.180°, k\in Z$	✓ ÷ $cos\theta$ ✓ $tan\theta=-\frac{3}{2}$ ✓ general solution. ✓ $k\in Z$ (4)
5.6	For ABCD a square, must/*Vir ABCD 'n vierkant, moet* BC=CD $\therefore OC=\frac{1}{2}CD$ .....$(OC=\frac{1}{2}BC)$ Now/*Nou* $tan\theta=\frac{CD}{OC}$ $=\frac{CD}{\frac{1}{2}CD}$ $=\frac{1}{\frac{1}{2}}=2$ $\therefore \theta=63{,}43°$	✓ BC=CD ✓ $OC=\frac{1}{2}CD$ ✓$tan\theta=\frac{CD}{OC}=2$ ✓ $\theta=63{,}43°$ (4)

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		[31]

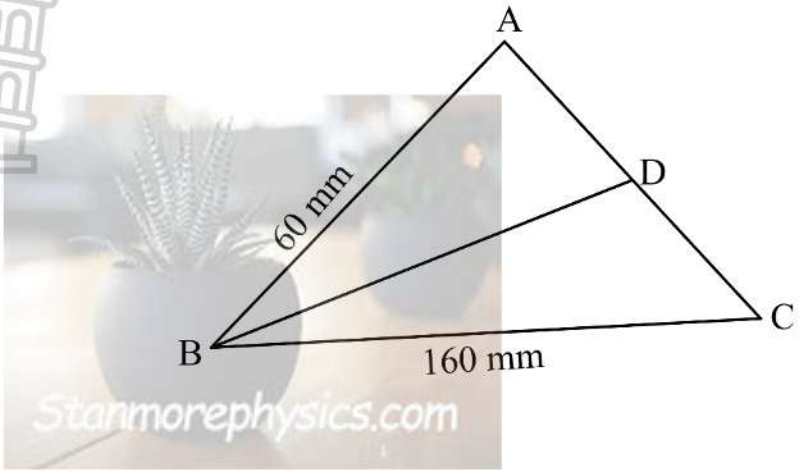
QUESTION/*VRAAG 6*



6.1	$a = 3$ $b = 1$	✓$a = 3$ ✓$b = 1$ (2)
6.2	$-3 \leq y \leq 3$ **OR** $y \in [-3\,;\,3]$	✓notation/*notasie* ✓ Correct values (2)
6.3	$p = sin71{,}6° = 0{,}95$ OR/ *OF* $p = 3cos71{,}6° = 0{,}95$ answer only: full marks	✓subst 71,6 in $f(x)$ or $g(x)$ ✓$p = 0{,}95$ (2)
6.4	B $(251{,}6° ; -0{,}95°)$ Through symmetry/*deur simmetrie*	✓$x = 251{,}6°$ ✓$y = -0{,}95°$ (2)
6.5	At/ *By* C: $2p = 3cosx$ $\therefore 1{,}9 = 3cosx$ $cosx = \frac{1{,}9}{3} = 0{,}63$ $x = 360° - 50{,}70°$ $\therefore x = 309{,}3°$ At/ *By* D: $y = \sin 309{,}3°$ $\therefore y = -0{,}77$ $CD = 1{,}9 - (-0{,}77)$ =2,67 units/ *eenh*	✓$1{,}9 = 3cosx$ ✓$cosx = 0{,}63$ ✓ $x = 309{,}3°$ ✓ $y = -0{,}77$ ✓CD=2,67 units/*eenh* (5)
		[13]

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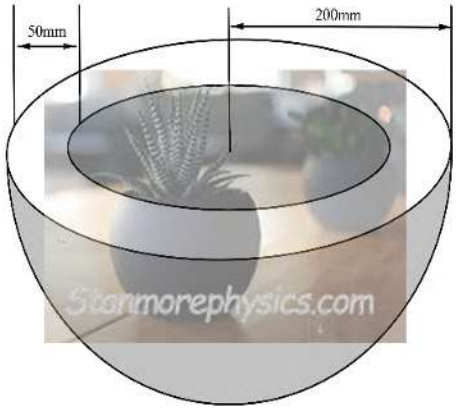
QUESTION/*VRAAG 7*



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7.1	$AC^2 = AB^2 + BC^2 - 2(AB)(BC)\cos A\hat{B}C$ $AC^2 = 60^2 + 160^2 - 2(60)(160)\cos 60°$ $AC^2 = 19600$ $AC = \sqrt{19600}$ $AC = 140mm$	✓subst. correctly into cos rule/ *vervang korrek in cos-reël.* ✓ $AC^2 = 19600$ ✓ $AC = 140mm$ (3)
7.2	$\frac{\sin\hat{A}}{BC} = \frac{\sin A\hat{B}C}{AC}$ $\frac{\sin\hat{A}}{160} = \frac{\sin 60°}{140}$ $\sin\hat{A} = \frac{160\sin 60°}{140}$ $\sin\hat{A} = \frac{160(\frac{\sqrt{3}}{2})}{140}$ $\sin\hat{A} = \frac{4\sqrt{3}}{7}$ $AD = \frac{1}{2}AC = 70mm$ $Area\Delta ABD = \frac{1}{2}AB.AD.sin\hat{A}$ $= \frac{1}{2}(60).(70).\frac{4\sqrt{3}}{7}$ $=1200\sqrt{3}$ units^2/*eenh*^{2}	✓ subst. correctly into sin rule/*vervang korrek in sin-reël.* ✓ $\sin\hat{A} = \frac{160\sin 60°}{140}$ ✓ $\sin\hat{A} = \frac{4\sqrt{3}}{7}$ ✓$AD = \frac{1}{2}AC = 70\ mm$ ✓$\frac{1}{2}(60).(70).\frac{4\sqrt{3}}{7}$ (5)
		[8]

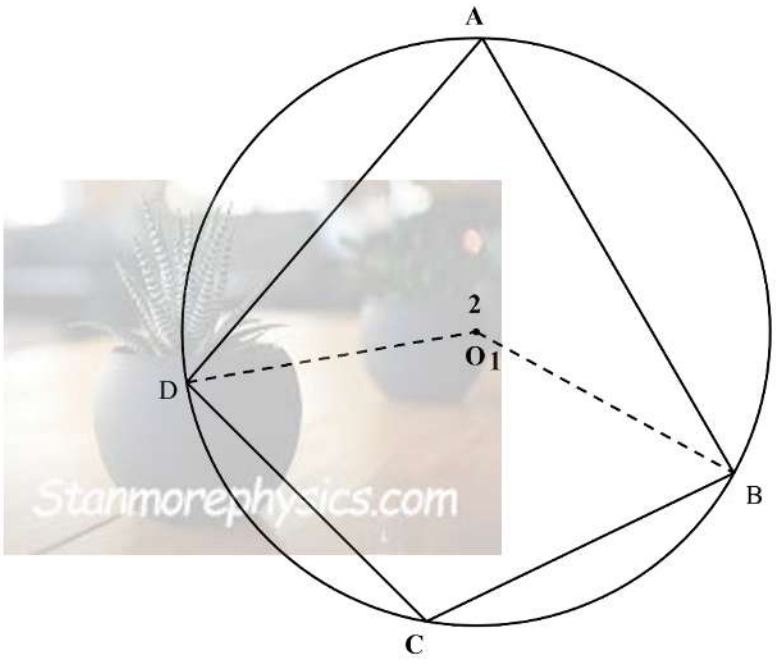
QUESTION/*VRAAG 8*



8.1	Volume $= \frac{1}{2} \times \frac{4}{3}\pi r^3 - \frac{1}{2} \times \frac{4}{3}\pi r^3$ $= \frac{1}{2} \times \frac{4}{3}\pi(200)^3 - \frac{1}{2} \times \frac{4}{3}\pi(150)^3$ $=9686577{,}35\ mm^3$	✓ $r = 150\ mm$ ✓substitution into correct formula/ *vervanging in korrekte formule.* ✓Volume $_1$ – Volume $_2$ ✓answer/*antwoord* (4)
8.2	$Area = \pi r^2 - \pi r^2$ $= \pi(200)^2 - \pi(150)^2$ $= 54977{,}87\ mm^2$	✓$Area = \pi r^2 - \pi r^2$ ✓substitution into correct formula/ *vervanging in korrekte formule.* ✓answer/*antwoord* (3)
		[7]

QUESTION/*VRAAG 9*

9.1

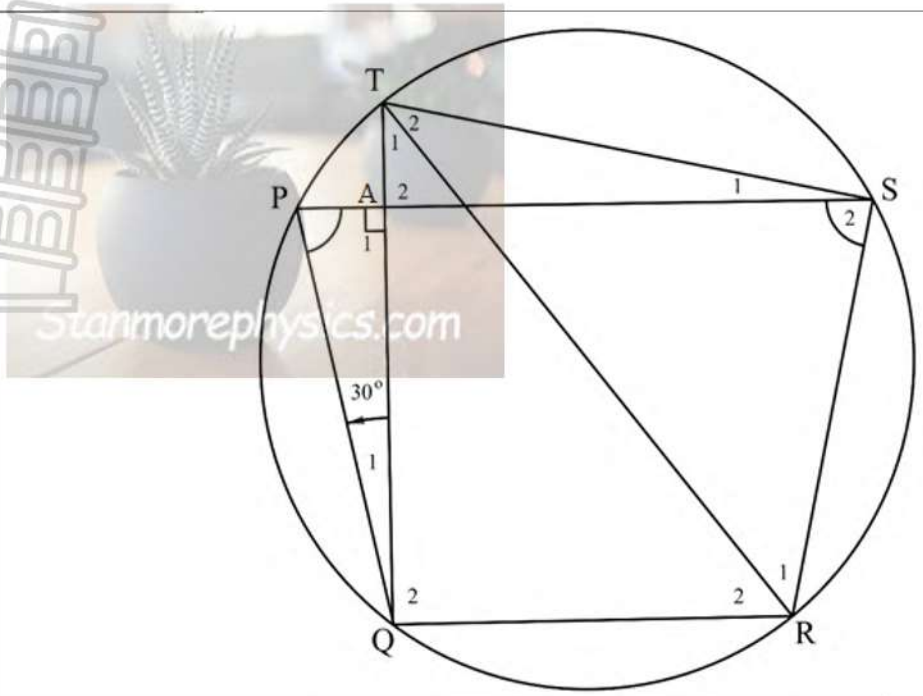


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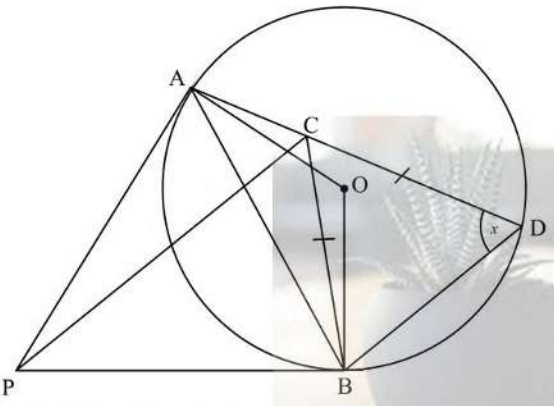
NOTE: If candidate fails to draw the construction or indicate the construction, it is an immediate BREAK DOWN. 0/5 marks.

NOTA: Indien kandidaat nie die konstruksie teken of aandui dat 'n konstruksie plaasvind nie, is dit 'n onmiddellike "BREAK DOWN" en daar word nie verder gemerk nie. 0/5 punte.

9.1	Construction: Connect BO and OD *Konstruksie: Verbind BO en OD* $\hat{O}_1 = 2\hat{A}$ [angle at centre = 2 × ∠at circumference/ *middelpunts ∠ = 2 × omtreks ∠*] $\hat{O}_2 = 2\hat{C}$ [angle at centre = 2 × ∠at circumference/ *middelpunts ∠ = 2 × omtreks ∠*] $\hat{O}_1 + \hat{O}_2 = 360°$ [$\angle^{s}$around a point $= 360°$/ $\angle^{e} om\ 'n\ punt = 360°$] $\therefore 2\hat{A} + 2\hat{C} = 360°$ $\therefore \hat{A} + \hat{C} = 180°$	✓ construction/ *konstruksie* ✓S ✓R ✓S/R ✓S $\hat{O}_1 + \hat{O}_2 = 360°$ (5)

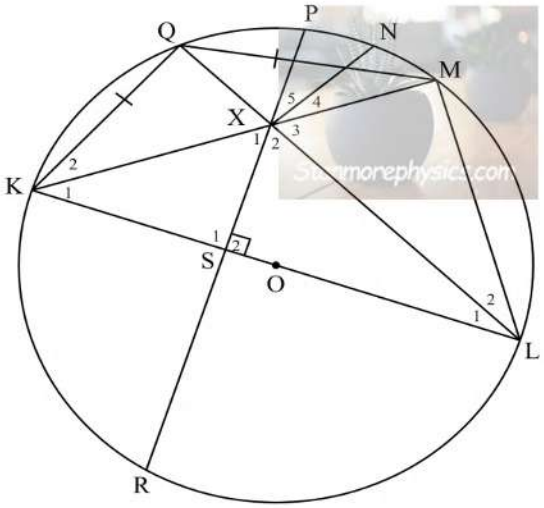
9.2		
9.2.1	$\hat{P} = 60°$ [$\angle$s in a Δ / $\angle e$ *in 'n* Δ] $\hat{S}_2 = \hat{P} = 60°$ [given/ *gegee*] $Q\hat{T}S = 60°$ [$\angle$s in the same circle segment/ $\angle e$ *in dieselfde sirkel segment*]	✓S/R ✓S ✓S ✓ R (4)
9.2.2	$Q\hat{R}S = 120°$ [opp $\angle$s of cyclic quad $= 180°$ / *t.o* $\angle$e *van* $KVH = 180°$]	✓S ✓R (2)
9.2.3	$\hat{S}_2 + Q\hat{R}S = 180°$ $\therefore PS \parallel QR$ [co-interior $\angle$s $= 180°$ / *ko-binne* $\angle e = 180°$]	✓R (1)
9.2.4	$\hat{A}_2 = \hat{Q}_2 = 90°$ [alt $\angle$s / *verw* $\angle e$; $PS \parallel QR$] $\therefore$ TR is diameter/ *middellyn.* [chord subtends 90° $\angle$ / *koord onderspan* 90° $\angle$]	✓S ✓ R ✓ R (3)
		[15]

QUESTION/*VRAAG 10*



10.1	Tangents from the same point/*raaklyne vanuit dieselfde punt.*	✓R (1)
10.2	$P\hat{A}O = 90°$ [radius ⊥ tangent/*raaklyn*]	✓S✓R (2)
10.3	$P\hat{B}O = 90°$ [radius ⊥ tangent/*raaklyn*] $AOBP$ is cycl. quad/ *KVH* [COVERSE opp ∠ s of cycl quad supplementary/ *OMGEKEERDE t.o. ∠* e *van KVH supplimentêr*] **OR** [opp ∠ s of quard = 180°/ t.o. ∠ *e* = 180°]	✓S/R ✓R (2)
10.4	$A\hat{O}B = 2x$ [angle at centre = 2 × ∠ at circumference/ *middelpunts ∠ = 2 × omtreks ∠*]	✓S✓R (2)
10.5	$C\hat{B}D = x$ [∠ s opp = sides/ *∠e teenoor = sye*] $A\hat{C}B = 2x$ [ext ∠ of Δ/ buite ∠ van Δ]	✓S/R ✓S✓R (3)
10.6	$A\hat{P}B = 180° - 2x$ [opp ∠ s of cycl quad supplementary/ *t.o. ∠* e *van KVH supplimentêr*] but/ *maar* $A\hat{C}B = 2x$ ∴ $A\hat{P}B + A\hat{C}B = 180° - 2x + 2x = 180°$ ∴ $ACBP$ is cycl. quad/ *KVH* [COVERSE opp ∠ s of cycl quad supplementary/ *OMGEKEERDE t.o. ∠* e *van KVH supplimentêr*] **OR** [opp ∠ s = 180°/ t.o. ∠ *e* = 180°]	✓S✓R ✓S ✓R (4)
10.7	$\hat{D} = P\hat{A}B = x$ [tan chord theorem/*raaklyn-koord stelling*] But/ *maar* $P\hat{A}B = P\hat{C}B = x$ [∠ s in the same circel segment/ *∠e in dieselfde sirkel segment*] But/ *maar* $A\hat{C}B = 2x$ ∴ $P\hat{C}B = \frac{1}{2}A\hat{C}B$ PC bisects/*halveer* $A\hat{C}B$	✓S✓R ✓S✓R (4)
		[18]

QUESTION/*VRAAG 11*



11.1	$K\widehat{M}L = 90°$ [$\angle$ in semi circle/ $\angle$ *in halwe sirkel*] $sin\widehat{K}_1 = \frac{ML}{KL} = \frac{12}{20}$ $\therefore \widehat{K} = 36{,}87°$	✓S✓R ✓trig ratio/ *verhouding* (3)
11.2	$\hat{X}_1 = 53{,}13°$ [$\angle$s in a Δ/ $\angle e$ *in 'n* Δ] $\hat{X}_1 = \hat{X}_4 + \hat{X}_5$ [Vertically opp $\angle$s/ *regoorstaande* $\angle e$] But/ *maar* $\hat{X}_4 = \hat{X}_5$ [NX is bisector/ *halveerlyn*] $\therefore \hat{X}_4 = 26{,}57°$	✓S/R ✓S/R ✓S (3)
11.3	$K\hat{L}M = 53{,}13°$ [$\angle$s in a Δ/ $\angle e$ *in 'n* Δ] But/ *maar* $\hat{L}_1 = \hat{L}_2$ [= chords ; = $\angle$s / = *koorde* ; = $\angle e$] $\therefore \hat{L}_2 = 26{,}57°$ $\therefore \hat{L}_2 = \hat{X}_4$ ∴NX is tangent/ *raaklyn.* [CONVERSE tan/chord theorem/ *OMGEKEERDE raaklyn/koord stelling.*] OR/ *OF* [$\angle$ between line and chord/ $\angle$ *tussen lyn en koord.*]	✓S ✓S✓R ✓S ✓R (5)
		[11]
	TOTAL/ *TOTAAL*:	**150**

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