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

GRADE/*GRAAD* 12

SEPTEMBER 2025

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

MARKS/*PUNTE*: 150

This marking guideline consists of 20 pages.
Hierdie nasienriglyn bestaan uit 20 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 a question, mark the crossed-out version.
- Consistency accuracy applies in ALL aspects of the marking guideline. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

GEOMETRY	
S	A mark for a correct statement. (A statement mark is independent of a reason).
R	A mark for the correct reason. (A reason mark may only be awarded only if the statement is correct).
S/R	Award a mark if a statement and a reason are both correct.

NOTA:

- As 'n kandidaat 'n vraag TWEEKEER beantwoord, merk slegs die EERSTE poging.
- As 'n kandidaat 'n poging van 'n vraag doodtrek en dit nie oordoen nie, merk die doodgetrekte poging.
- Volgehoue akkuraatheid word in ALLE aspekte van die nasienriglyn toegepas. Hou op nasien by die tweede berekeningsfout.
- Om antwoorde/waardes te aanvaar om 'n probleem op te los, word NIE toegelaat nie.

MEETKUNDE	
S	'n Punt vir korrekte bewering. ('n Punt vir 'n bewering is onafhanklik van die rede.)
R	'n Punt vir 'n korrekte rede. ('n Punt word slegs vir die rede toegeken as die bewering korrek is.)
S/R	Ken 'n punt toe as die bewering en rede beide korrek is.



QUESTION/VRAAG 1

Data Set/Datastel:

15	17	20	20	20	21	22	24
29	29	30	$11t$	$11t + 2$	36	38	55

1.1	Mode / <i>Modus</i> = 20	✓ answer/ <i>antwoord</i>	(1)
1.2	$Q_1 = 20$ $Q_3 = \frac{22t + 2}{2} = 11t + 1$ $IQR = Q_3 - Q_1$ $14 = 11t + 1 - 20$ $\therefore t = 3$	✓ Q_1 ✓ $Q_3 = 11t + 1$ ✓ answer/ <i>antwoord</i>	(3)
1.3	$\bar{x} = \frac{444}{16}$ $\therefore = 27,75$ (Answer only full marks/ <i>Slegs antwoord – volpunte</i>)	✓ 444 ✓ answer/ <i>antwoord</i>	(2)
1.4	Standard deviation / <i>Standaardafwyking</i> = 9,86	✓ answer/ <i>antwoord</i>	(1)
1.5	$\bar{x} - sd = 27,75 - 9,86$ $= 17,89$ 2 visitors 2 <i>besoekers</i>	✓ $27,75 - 9,86$ correct substitution <i>korrekte vervanging</i> ✓ 17,89 ✓ answer/ <i>antwoord</i>	(3)
			[10]

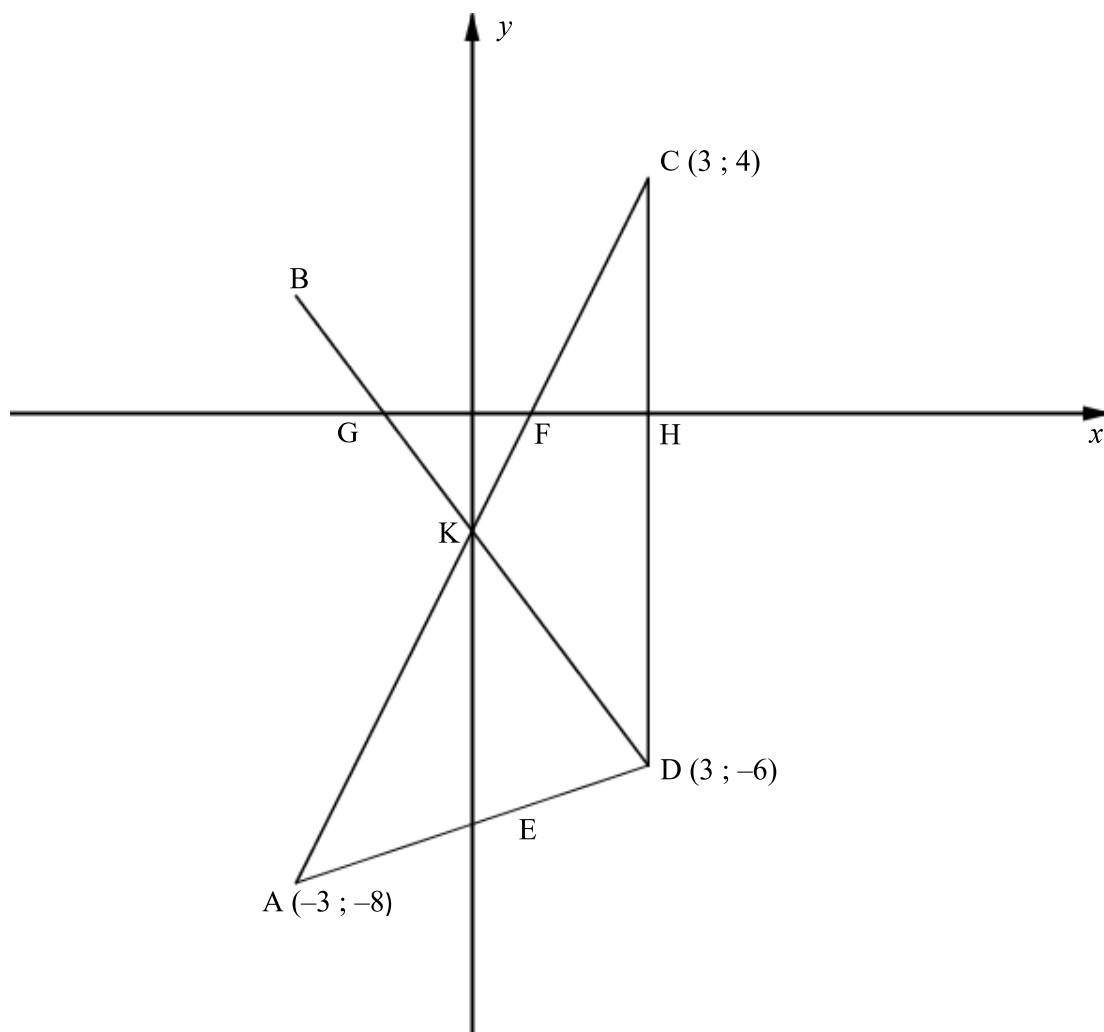


QUESTION/VRAAG 2

Years / Jaar		1	2	3	4	5	6	7	8	9	10
Temperatures (degrees Celsius) x		41	9	30	15	25	20	20	35	39	16
Temperature (grade Celsius) x											
Finishing times of athletes (in minutes) y		72	30	66	29	45	43	41	66	68	31
Eindtyd van atleet (in minute) y											
2.1	$r = 0,96$					✓ answer/antwoord					(1)
2.2	Very strong positive correlation <i>Baie sterk positiewe korrelasie</i>					✓ very strong positive correlation <i>Baie sterk positiewe korrelasie</i>					(1)
2.3	$a = 10,92$ $b = 1,53$ $y = 10,92 + 1,53x$					✓ correct value of a <i>korrekte waarde van a</i> ✓ correct value of b <i>korrekte waarde van b</i> ✓ answer/antwoord					(3)
2.4	$57 = 10,92 + 1,53x$ $x = 30$					✓ substitution/vervanging ✓ answer/antwoord					(2)
2.5	Temperatures versus Finishing Time <i>Temperature teenoor Eindtyd</i> Finishing Time (in minutes) <i>Eindtyd (in minute)</i> Temperatures (in Degrees Celcius) <i>Temperature (in Grade Celsius)</i>					✓ Any two correct points <i>Enige twee korrekte punte</i> ✓ straight line joining points for $x \in [9; 41]$ <i>Reguitlyn verbind punte vir $x \in [9; 41]$</i>					(2)
											[9]



QUESTION/VRAAG 3



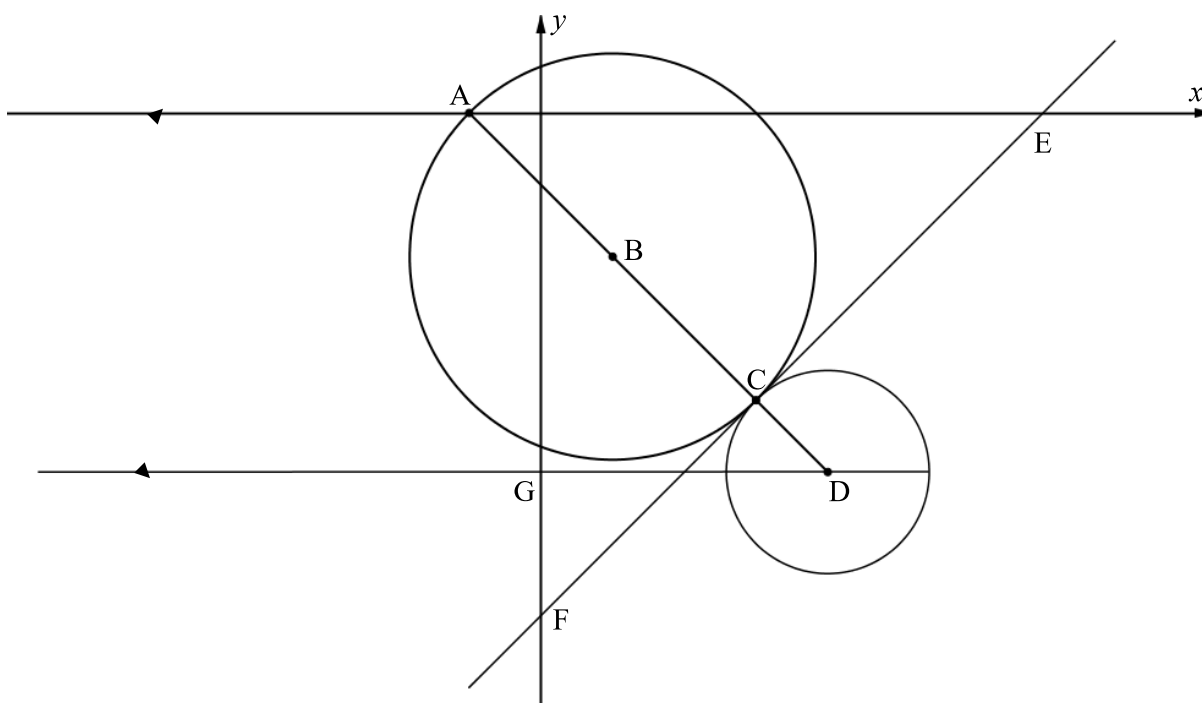
3.1	$AC = \sqrt{(-3-3)^2 + (-8-4)^2}$ $= 6\sqrt{5}$	✓ correct substitution/ <i>korrekte vervanging</i> ✓ correct answer/ <i>korrekte antwoord</i>	(2)
3.2	$m_{AC} = \frac{4+8}{3+3}$ $= 2$	✓ correct substitution/ <i>korrekte vervanging</i> ✓ answer/ <i>antwoord</i>	(2)
3.3	$m_{AD} = \frac{-6+8}{3+3}$ $= \frac{1}{3}$ $y+8 = \frac{1}{3}(x+3)$ $y = \frac{1}{3}x - 7$	✓ m_{AD} ✓ substitution of m_{AD} and D(3 ; - 6) or A(-3 ; -8) <i>vervanging van m_{AD} en D(3 ; - 6) of A(-3 ; -8)</i> ✓ Equation/ <i>Vergelyking</i>	(3)



3.4	$\tan \hat{BGF} = m_{BD} = -\frac{4}{3}$ $\hat{BGF} = 126,87^\circ$ $\hat{KGF} = 53,13^\circ$ [$\angle$ s on a str. line / $\angle$ op'n reguitlyn] $\tan \hat{CFH} = 2$ $\hat{CFH} = 63,44^\circ$ $\hat{GFK} = 63,44^\circ$ [vert. opp $\angle$ s / regoorst. $\angle$ e] $\therefore \hat{CKD} = 116,57^\circ$ [ext $\angle$ of $\triangle GKF$ / buite $\angle$ van $\triangle GKF$] OR/OF $m_{AC} = 2$ $\tan \hat{CFH} = 2$ $\hat{CFH} = 63,44^\circ$ $\hat{GFK} = 63,44^\circ$ [vert. opp $\angle$ s / regoorst. $\angle$ e] $\tan \hat{BGF} = m_{BD} = -\frac{4}{3}$ $\hat{BGF} = 126,87^\circ$ $\hat{BKC} = 63,43^\circ$ [ext $\angle$ of $\triangle GKF$ / buite $\angle$ van $\triangle GKF$] $\hat{CKD} = 116,57^\circ$ [$\angle$ s on a str. line / $\angle$ op'n reguitlyn]	$\checkmark \hat{BGF} = 126,87^\circ$ $\checkmark \hat{KGF} = 53,13^\circ$ $\checkmark \hat{CFH} = 63,44^\circ$ $\checkmark \hat{GFK} = 63,44^\circ$ $\checkmark$ answer/antwoord OR/OF $\checkmark \hat{CFH} = 63,44^\circ$ $\checkmark \hat{GFK} = 63,44^\circ$ $\checkmark \hat{BGF} = 126,87^\circ$ $\checkmark \hat{BKC} = 63,43^\circ$ $\checkmark$ answer/antwoord	(5)
3.5	$K(0; -2)$ $KD = \sqrt{(0-3)^2 + (-2+6)^2}$ $= 5$ $CK = 3\sqrt{5}$ Area of $\triangle CKD$ / Oppervlakte van $\triangle CKD$ $= \frac{1}{2} \times 2\sqrt{5} \times 5 \times \sin 116,57^\circ$ $= 15$	$\checkmark K(0; -2)$ $\checkmark KD = 5$ $\checkmark CK = 3\sqrt{5}$ $\checkmark$ correct substitution korrekte vervanging $\checkmark$ answer/antwoord	(5)
3.6	$x = 3$	$\checkmark$ answer/antwoord	(1)
3.7	$E(0; -7)$ or $EK = 5$ $CD = 10$ height of/hoogte van trapezium = 3 $\text{Area of / van } EKCD = \frac{1}{2}(5+10) \times 3$ $= \frac{45}{2}$ $\frac{\text{Area of / van } \triangle CKD}{\text{Area of / van } EKCD} = 15 \times \frac{2}{45}$ $= \frac{2}{3}$	$\checkmark E(0; -7)$ or $EK = 5$ $\checkmark CD = 10$ $\checkmark$ height/hoogte = 3 $\checkmark \frac{45}{2}$ $\checkmark$ answer/antwoord	(5)
			[23]



QUESTION/VRAAG 4



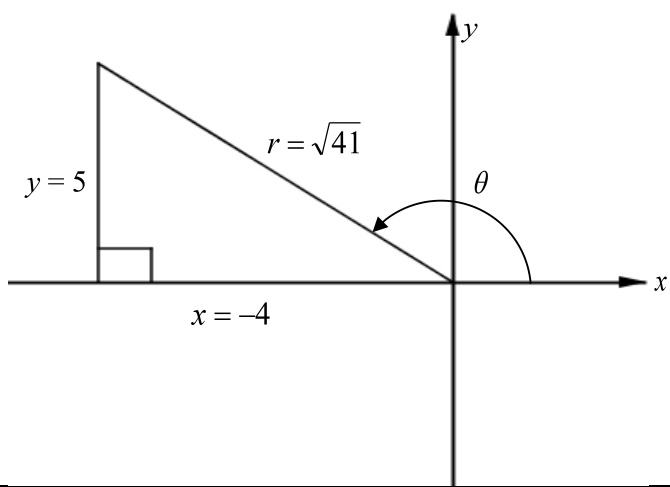
4.1	$x^2 + y^2 - 2x + 4y - 3 = 0$ $(x-1)^2 + (y+2)^2 = 8$ $\therefore B(1; -2)$	✓ completing square <i>voltooiing van vierkant</i> ✓ x-coordinate/x-koördinaat ✓ y-coordinate/y-koördinaat	(3)
4.2	$x^2 + 0^2 - 2x + 4 \cdot 0 - 3 = 0$ $x^2 - 2x - 3 = 0$ $(x-3)(x+1) = 0$ $x \neq 3$ or $x = 1$ $\therefore A(-1; 0)$	✓ $y = 0$ ✓ standard form/standaardvorm ✓ correct x-coordinate <i>korrekte x-koördinaat</i>	(3)
4.3	$m_{AB} = \frac{-2-0}{1+1}$ $= -1$	✓ substitution into correct formula <i>vervanging in korrekte formule</i> ✓ answer/antwoord	(2)
4.4	$\hat{ACE} = 90^\circ$ [diameter $\perp$ tan / middellyn $\perp$ raaklyn] $AB = 2\sqrt{2}$ radius $\therefore AC = 4\sqrt{2}$ diameter / middellyn $CE^2 = 8^2 - (4\sqrt{2})^2$ $CE = 4\sqrt{2}$	✓ $\hat{ACE} = 90^\circ$ ✓ $AC = 4\sqrt{2}$ (diameter / middellyn) ✓ correct use of Pyth. Theorem <i>korrekte gebruik van Pyth. Stel.</i> ✓ $CE = 4\sqrt{2}$	(4)



4.5	$D(x; -5)$ $GD \parallel x\text{-axis}$ $m_{AD} = m_{AB}$ collinear points/samelynige punte $\frac{-5-0}{x+1} = -1$ $-x-1 = -5$ $\therefore x = 4$ $D(4; -5)$ OR/OF $D(x; -5)$ $GD \parallel x\text{-axis} / -as$ $m_{BD} = m_{AB}$ collinear points / saamlynige punte $\frac{-2+5}{1-x} = -1$ $x-1 = 3$ $\therefore x = 4$ $D(4; -5)$ OR/OF $\hat{ACE} = 90^\circ$; $D(x; -5)$ and/en $E(7; 0)$ $DE^2 = (x-7)^2 + (-5-0)^2$ $= x^2 - 14x + 74$ $CE^2 = 32$ $CD^2 = (3-x)^2 + (-4+5)^2$ $= 10 - 6x + x^2$ $x^2 - 14x + 74 = -6x + x^2 + 10 + 32$ $-8x = -32$ $x = 4$ $D(4; -5)$	$\checkmark D(x; -5)$ $\checkmark m_{AD} = m_{AB}$ $\checkmark \frac{-5-0}{x+1} = -1$ $\checkmark \therefore x = 4$ OR/OF $\checkmark D(x; -5)$ $\checkmark m_{BD} = m_{AB}$ $\checkmark \frac{-2+5}{1-x} = -1$ $\checkmark \therefore x = 4$ OR/OF $\checkmark$ standard form of DE^2 <i>standaardvorm van DE^2</i> $\checkmark$ standard form of CD^2 <i>standaardvorm van CD^2</i> $\checkmark$ simplification <i>vereenvoudiging</i> $\checkmark x = 4$	(4)
4.6	$CD^2 = (7-4)^2 - (4\sqrt{2})^2$ $= 2$ $(x-4)^2 + (y+5)^2 = 2$	$\checkmark CD^2 = 2$ $\checkmark$ LHS of the equation <i>LK van die vergelyking</i> $\checkmark$ RHS of the equation <i>RK van die vergelyking</i>	(3)
			[19]



QUESTION/VRAAG 5

5.1			
5.1.1	$r = \sqrt{3^2 + (-4)^2} = 5$ $\cos \theta = -\frac{4}{\sqrt{41}}$	✓ value of r / waarde van r ✓ answer/antwoord	(2)
5.1.2	$2 \sin^2 \theta = 2 \left(\frac{5}{\sqrt{41}} \right)^2$ $= \frac{50}{41}$	✓ correct substitution korrekte vervanging ✓ correct answer korrekte antwoord	(2)
5.1.3	$\cos(90^\circ - 2\theta) = \sin 2\theta$ $= 2 \sin \theta \cos \theta$ $= 2 \left(\frac{5}{\sqrt{41}} \right) \left(-\frac{4}{\sqrt{41}} \right)$ $= -\frac{40}{41}$	✓ reduction/reduksie ✓ identity/identiteit ✓ correct substitution korrekte vervanging ✓ answer/antwoord	(4)
5.2	$\text{LHS/LK} = \frac{3 \cos 2x + 3 \cos^2 x + 9 \sin^2 x}{4 - 4 \sin^2 x}$ $= \frac{3(2 \cos^2 x - 1) + 3 \cos^2 x + 9(1 - \cos^2 x)}{4(1 - \sin^2 x)}$ $= \frac{6 \cos^2 x - 3 + 3 \cos^2 x + 9 - 9 \cos^2 x}{4 \cos^2 x}$ $= \frac{6}{4 \cos^2 x}$ $= \frac{3}{2 \cos^2 x}$	✓ $2 \cos^2 x - 1$ ✓ $1 - \cos^2 x$ ✓ $1 - \sin^2 x$ ✓ $\frac{6}{4 \cos^2 x}$	(4)





	OR/OF	OR/OF	
	$\begin{aligned} \text{LHS/LK} &= \frac{3 \cos 2x + 3 \cos^2 x + 9 \sin^2 x}{4 - 4 \sin^2 x} \\ &= \frac{3(1 - 2 \sin^2 x) + 3(1 - \sin^2 x) + 9 \sin^2 x}{4(1 - \sin^2 x)} \\ &= \frac{6}{4 \cos^2 x} \\ &= \frac{3}{2 \cos^2 x} \end{aligned}$	$\begin{aligned} &\checkmark 1 - 2 \sin^2 x \checkmark 1 - \sin^2 x \\ &\checkmark \cos^2 x \\ &\checkmark \frac{6}{4 \cos^2 x} \end{aligned}$	(4)
5.3	$\begin{aligned} &\frac{\cos x \cdot \cos(90^\circ - x) \sin(48^\circ - x) + \sin^2 x \cos(48^\circ - x)}{\sin(-x) \cdot \cos 24^\circ \cdot \cos 66^\circ} \\ &= \frac{\cos x \cdot \sin x \sin(48^\circ - x) + \sin^2 x \cos(48^\circ - x)}{(-\sin x) \cos 24^\circ \sin 24^\circ} \\ &= \frac{\sin x [\sin(48^\circ - x) \cos x + \sin x \cos(48^\circ - x)]}{(-\sin x) \left(\frac{\sin 48^\circ}{2} \right)} \\ &= \frac{\sin(48^\circ - x + x)}{-\frac{1}{2} \sin 48^\circ} \\ &= \frac{\sin 48^\circ}{-\frac{1}{2} \sin 48^\circ} \\ &= -2 \end{aligned}$	$\begin{aligned} &\checkmark \sin x \\ &\checkmark -\sin x \checkmark \sin 24^\circ \\ &\checkmark \text{taking out common } \sin x \\ &\quad \text{uithaal van } \sin x \text{ as} \\ &\quad \text{gemene faktor} \\ &\checkmark \frac{1}{2} \sin 48^\circ \\ &\checkmark \text{compound angle} \\ &\quad \text{saamgestelde hoek} \\ &\checkmark \text{answer/antwoord} \end{aligned}$	
	OR/OF $\begin{aligned} &\frac{\cos x \cdot \cos(90^\circ - x) \sin(48^\circ - x) + \sin^2 x \cos(48^\circ - x)}{\sin(-x) \cdot \cos 24^\circ \cdot \cos 66^\circ} \\ &= \frac{\cos x \cdot \sin x \sin(48^\circ - x) + \sin^2 x \cos(48^\circ - x)}{(-\sin x) \cos 24^\circ \sin 24^\circ} \\ &= \frac{\sin x [\sin(48^\circ - x) \cos x + \sin x \cos(48^\circ - x)]}{(-\sin x) \sin 24^\circ \cos 24^\circ} \\ &= \frac{\sin(48^\circ - x + x)}{-\frac{1}{2} \sin 48^\circ} \\ &= \frac{2 \sin 24^\circ \cos 24^\circ}{-\sin 24^\circ \cdot \cos 24^\circ} \\ &= -2 \end{aligned}$	OR/OF $\begin{aligned} &\checkmark \sin x \\ &\checkmark -\sin x \checkmark \sin 24^\circ \\ &\checkmark \text{taking out common } \sin x \\ &\quad \sin x \text{ as gemene faktor} \\ &\checkmark \text{compound angle} \\ &\quad \text{saamgestelde hoek} \\ &\checkmark 2 \sin 24^\circ \cos 24^\circ \\ &\checkmark \text{answer/antwoord} \end{aligned}$	(7)



5.4.1	$\left[\cos(60^\circ - x) + \cos(x + 60^\circ) \right]^2$ $= \left[\cos 60^\circ \cos x + \sin 60^\circ \sin x + \cos x \cos 60^\circ - \sin x \sin 60^\circ \right]^2$ $= \left[2 \cos 60^\circ \cos x \right]^2$ $= \left[2 \cdot \frac{1}{2} \cos x \right]^2$ $= \cos^2 x$	✓ expansion/ uitbreiding ✓ simplification vereenvoudiging ✓ answer/antwoord	(3)
5.4.2	$\cos^2 x = \frac{3}{4}$ $\cos x = \pm \frac{\sqrt{3}}{2}$ $x = \pm 30^\circ + 360^\circ \cdot k \quad \text{or / of} \quad x = \pm 150^\circ + 360^\circ \cdot k, \quad k \in \mathbb{Z}$	✓ $\cos^2 x = \frac{3}{4}$ ✓ $\cos x = \pm \frac{\sqrt{3}}{2}$ ✓ $\pm 30^\circ + 360^\circ \cdot k, k \in \mathbb{Z}$ ✓ $\pm 150^\circ + 360^\circ \cdot k$	(4)
			[26]

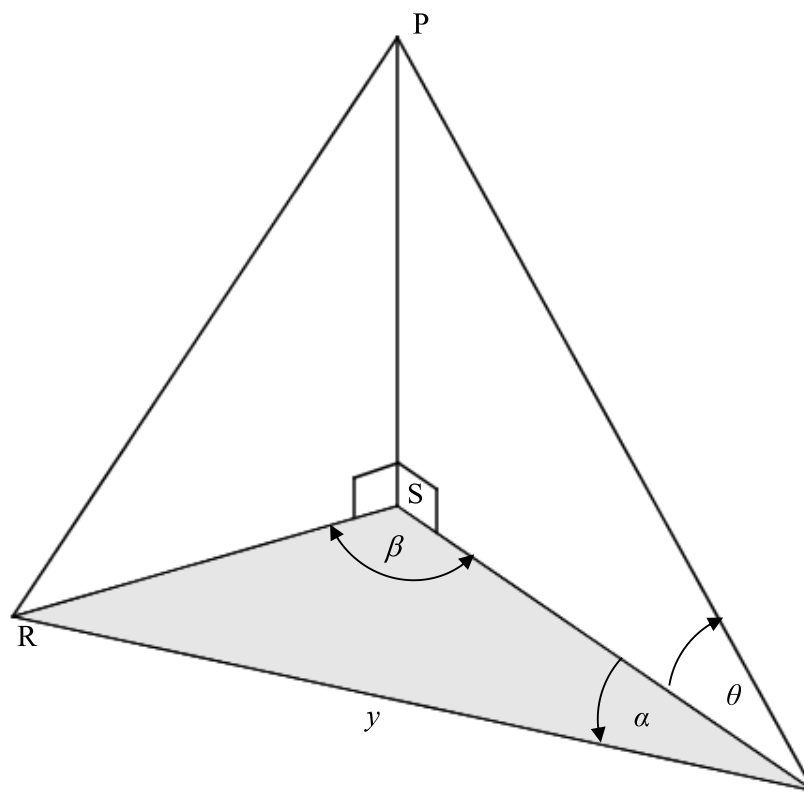


QUESTION/VRAAG 6

6.1	Range/ Waardeversameling: $y \in \left[-\frac{3}{2}; \frac{1}{2}\right]$ or/of $-\frac{3}{2} \leq y \leq \frac{1}{2}$	✓ correct critical values korrekte kritieke waarde ✓ correct notation korrekte notasie	(2)
6.2		✓ correct intercepts with the axis/korrekte afsnitte met die asse ✓ correct turning points/korrekte draaipunte ✓ shape/vorm	(3)
6.3	$x = -120^\circ$ and/en $x = 240^\circ$	✓✓ each x-value/ elke x-waarde	(2)
6.4	$0^\circ < x < 180^\circ$	✓ correct critical values/ korrekte kritieke waardes ✓ correct notation/ korrekte notasie	(2)
6.5	Amplitude / Amplitude = 1	✓ answer/antwoord	(1)
6.6	The graph of f is translated/shifted $\frac{1}{2}$ units up and reflected about the x -axis. Die grafiek van f skuif $\frac{1}{2}$ eenheid op en word gereflekteer om die x -as.	✓ $\frac{1}{2}$ units up $\frac{1}{2}$ eenheid op ✓ reflected about the x -axis gereflekteer om die x -as	(2)
			[12]



QUESTION/VRAAG 7



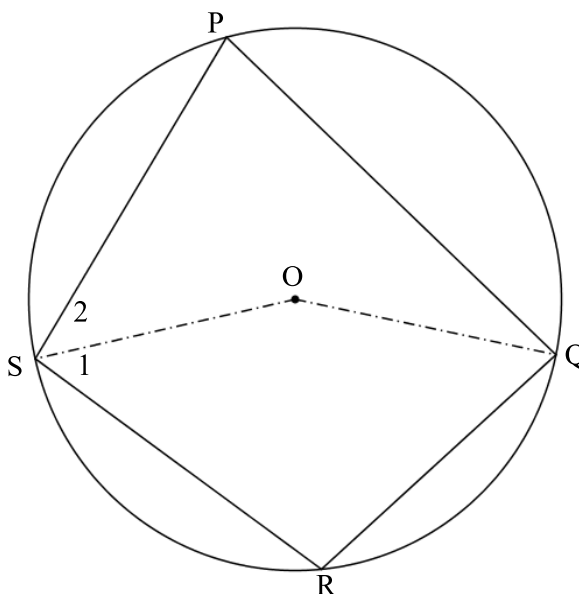
7.1	$\hat{SRQ} = 180^\circ - (\alpha + \beta)$	✓ answer/antwoord	(1)
7.2	$\frac{SQ}{\sin(180^\circ - (\alpha + \beta))} = \frac{y}{\sin \beta}$ $SQ = \frac{y \sin(180^\circ - (\alpha + \beta))}{\sin \beta}$ $SQ = \frac{y \sin(\alpha + \beta)}{\sin \beta}$ $\tan \theta = \frac{PS}{SQ}$ $PS = \tan \theta \cdot SQ$ $PS = \frac{y \cdot \tan \theta \cdot \sin(\alpha + \beta)}{\sin \beta}$	✓ use of sine rule <i>gebruik van sinusreël</i> ✓ $\sin(\alpha + \beta)$ reduction/ <i>vermindering</i> ✓ correct ratio of $\tan \theta$ <i>korrekte verhouding van $\tan \theta$</i>	(3)
7.3	$PS = \frac{(116) \cdot \tan 57^\circ \cdot \sin(27^\circ + 102^\circ)}{\sin 102^\circ}$ $PS = 141,92 \text{ units/eenhede}$	✓ substitution/ <i>vervanging</i> ✓ answer/antwoord	(2)



7.4	$\frac{\sin \alpha}{RS} = \frac{\sin \beta}{y}$ $\frac{\sin 27^\circ}{RS} = \frac{\sin 102^\circ}{116}$ $RS = \frac{116 \sin 27^\circ}{\sin 102^\circ}$ $RS = 53,84 \text{ units}$ $\tan \hat{P}RS = \frac{PS}{RS}$ $\tan \hat{P}RS = \frac{141,92}{53,84}$ $\hat{P}RS = \tan^{-1} \left(\frac{141,92}{53,84} \right)$ $\therefore \text{PRS} = 69,22^\circ$	✓ substitution into sine rule <i>vervanging in die sinusreël</i> ✓ length of RS/<i>lengte van RS</i> ✓ correct substitution ratio of $\tan \hat{P}RS$ <i>korrekte vervanging verhouding van $\tan \hat{P}RS$</i> ✓ answer/<i>antwoord</i>	(4)
			[10]

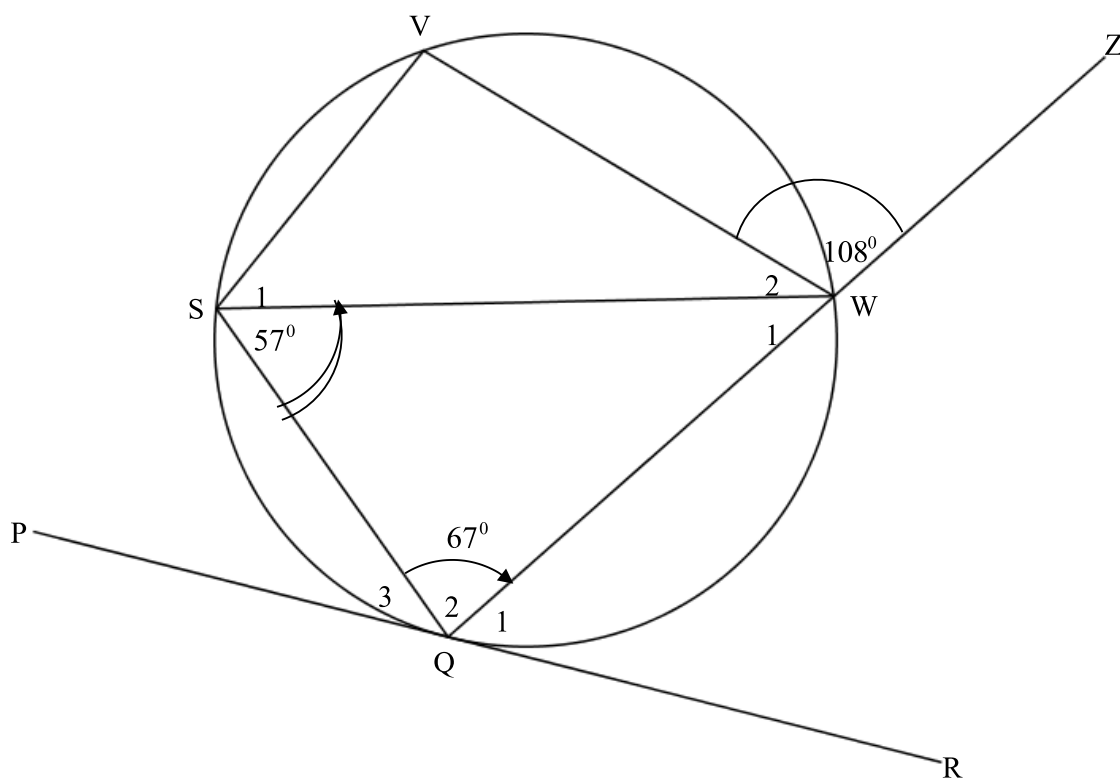


QUESTION/VRAAG 8



8.1	Constructions: Draw radii OS and OQ <i>Proof :</i> $\hat{O}_1 = 2\hat{P} \quad [\angle \text{ at centre} = 2\angle \text{ at circumf}]$ $\hat{O}_2 = 2\hat{R} \quad [\angle \text{ at centre} = 2\angle \text{ at circumf}]$ $\hat{O}_1 + \hat{O}_2 = 360^\circ \quad [\angle \text{ s around a point}]$ $2\hat{P} + 2\hat{R} = 360^\circ \quad [\text{Substitution}]$ $\hat{P} + \hat{R} = 180^\circ$	✓ Construction ✓ S/R ✓ S ✓ S/R ✓ S	(5)
8.1	Konstruksies: Teken radiusse OS en OQ <i>Bewys :</i> $\hat{O}_1 = 2\hat{P} \quad [\text{Middelpunts } \angle = 2 \times \text{Omtreks } \angle]$ $\hat{O}_2 = 2\hat{R} \quad [\text{Middelpunts } \angle = 2 \times \text{Omtreks } \angle]$ $\hat{O}_1 + \hat{O}_2 = 360^\circ \quad [\angle \text{'e om'n punt}]$ $2\hat{P} + 2\hat{R} = 360^\circ \quad [\text{Vervanging}]$ $\hat{P} + \hat{R} = 180^\circ$	✓ Konstruksie ✓ S/R ✓ S ✓ S/R ✓ S	(5)





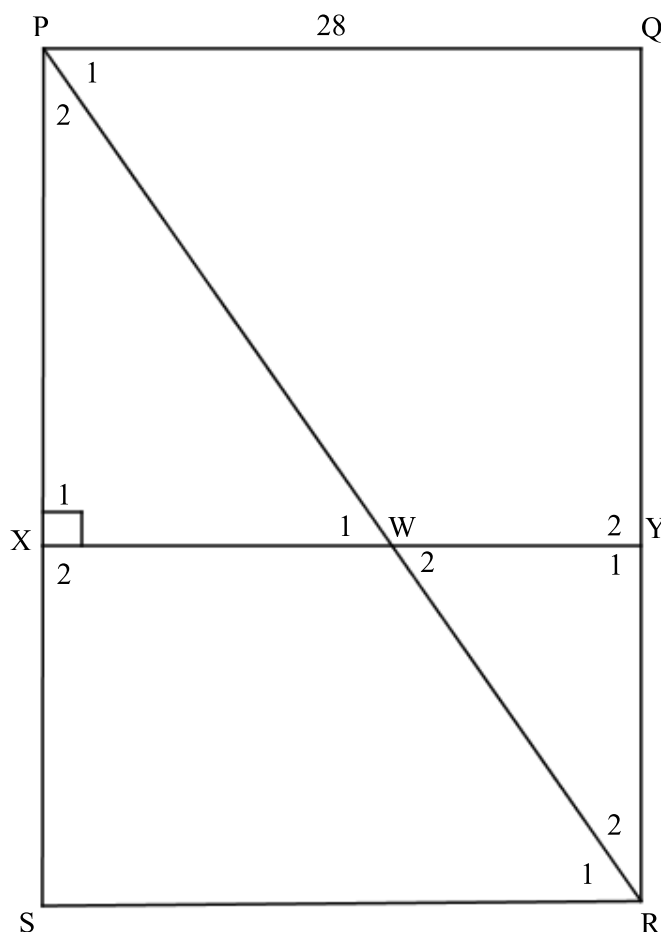
8.2.1	$\hat{V} = 113^\circ$	[opp $\angle$ s of a cyclic quad] [teenoorst. $\angle$ van koordev.]	✓ S ✓ R	(2)
8.2.2	$\hat{S}_1 = 51^\circ$	[ext $\angle$ of a cyclic quad] [buite $\angle$ van koordevh]	✓ S ✓ R	(2)
8.2.3	$\widehat{WQR} = 57^\circ$	[tan – chord theorem] [raaklyn – koord stelling]	✓ S ✓ R	(2)
				[11]



9.4	$\hat{D}_2 = \hat{E}_3$ [$\angle$ s same seg] / [$\angle$ e in dies. segment] $\hat{E}_3 = \hat{A}$ [proved 9.2] / [bewys in 9.2] $\therefore \hat{A} = \hat{D}_2$ $\therefore$ CD is a tangent to circle ABD [converse tan chord theo] CD is 'n raaklyn aan die sirkel ABD [omgekeerde raaklyn koord stelling]	✓ S ✓ R ✓ R	(3)
9.5	$\triangle BCD$ and/en $\triangle ABE$ $\hat{E}_2 = \hat{C}$ [ext $\angle$ of a cyclic quad]/[buite $\angle$ van kv] $\hat{A} = \hat{D}_2$ [tan chord theo] / [raaklyn - koord stelling] $\hat{B}_1 = \hat{B}_3$ [3rd $\angle$] / [3^{de} $\angle$] $\therefore \triangle EAB \parallel \triangle CDB$ [$\angle\angle\angle$] $\frac{AE}{CD} = \frac{EB}{CB}$ $CD = \frac{AE \times CB}{EB}$ $\therefore \frac{AE \times CB}{EB} = \frac{EB \times AC}{AE}$ [both/beide = CD] $\frac{EB^2}{AE^2} = \frac{BC}{AC}$ OR/OF $\triangle BCD$ and/en $\triangle ABE$ $\hat{E}_2 = \hat{C}$ [ext $\angle$ of a cyclic quad]/[buite $\angle$ van kv] $\hat{A} = \hat{D}_2$ [proved 9.4] / [bewys in 9.4] $\hat{B}_1 = \hat{B}_3$ [3rd $\angle$] / [3^{de} $\angle$] $\therefore \triangle EAB \parallel \triangle CDB$ [$\angle\angle\angle$] $\frac{AE}{CD} = \frac{EB}{CB}$ $CD \times EB = AE \times CB$ $\left(\frac{EB \times AC}{AE}\right) \times EB = AE \times CB$ from/vanaf 9.3 $\frac{EB^2}{AE^2} = \frac{BC}{AC}$	✓ S ✓ R ✓ S ✓ R ✓ correct ratio korrekte verhouding ✓ equating CD gelyk stel CD OR/OF ✓ S ✓ R ✓ S ✓ R ✓ correct ratio korrekte verhouding ✓ substitute CD vervang CD	(6)
			[19]



QUESTION/VRAAG 10



10.1	$\hat{P} = 90^\circ$ [$\angle$ s of a rect = 90°] / [<i>Le van reghoek = 90°</i>] $\therefore XY \parallel PQ$ [co-int. $\angle$ s suppl] / [<i>ko-binne $\angle$e is suppl</i>]	✓ S ✓ R	(2)
10.2	$\frac{WR}{PR} = \frac{YR}{RQ}$ [prop theo, $XY \parallel PS$ / line $\parallel$ to one side of a Δ] <i>[eweredigh stelling, $XY \parallel PS$ / lyn $\parallel$ aan een sy van Δ]</i> $\frac{WR}{42} = \frac{3x}{7x}$ $\therefore WR = 18$ OR/OF $\frac{PR}{PW} = \frac{QR}{QY}$ [prop theo, $XY \parallel PS$ / line $\parallel$ to one side of a Δ] <i>[eweredigh stelling, $XY \parallel PS$ / lyn $\parallel$ aan een sy van Δ]</i> $\frac{42}{PW} = \frac{7x}{4x}$ $\therefore PW = 24$ $\therefore WR = 18$	✓ S ✓ R ✓ correct substitution <i>korrekte vervanging</i> ✓ <i>answer/antwoord</i> OR/OF ✓ S ✓ R ✓ correct substitution <i>korrekte vervanging</i> ✓ <i>answer/antwoord</i>	(4)





10.3	$\hat{P}_2 = \hat{P}_2$ [common] / [gemeen] $\hat{X}_1 = \hat{S} = 90^\circ$ [corresp, $\angle$ s, $XY \parallel SR$] [ooreenk. $\angle$ e, $XY \parallel SR$] $\hat{W}_1 = \hat{R}_1$ [3rd $\angle$ s] / [3^{de} $\angle$] $\Delta PXW \parallel \Delta PSR$ [$\angle\angle\angle$] $\frac{XW}{SR} = \frac{PW}{PR}$ [$\parallel \Delta$ s] $SR = 28$ [opp sides of a rect.] [teenoorst. sye van 'n reghoek] $\frac{XW}{28} = \frac{24}{42}$ $XW = 16$	✓ S for identifying $\parallel \Delta$ s <i>identifisering van $\parallel \Delta$s</i> ✓ S ✓ S/R ✓ substitution into correct ratios <i>vervanging in korrekte verhoudings</i> ✓ answer / <i>antwoord</i>	(5)
			[11]
			TOTAL/TOTAAL: 150

