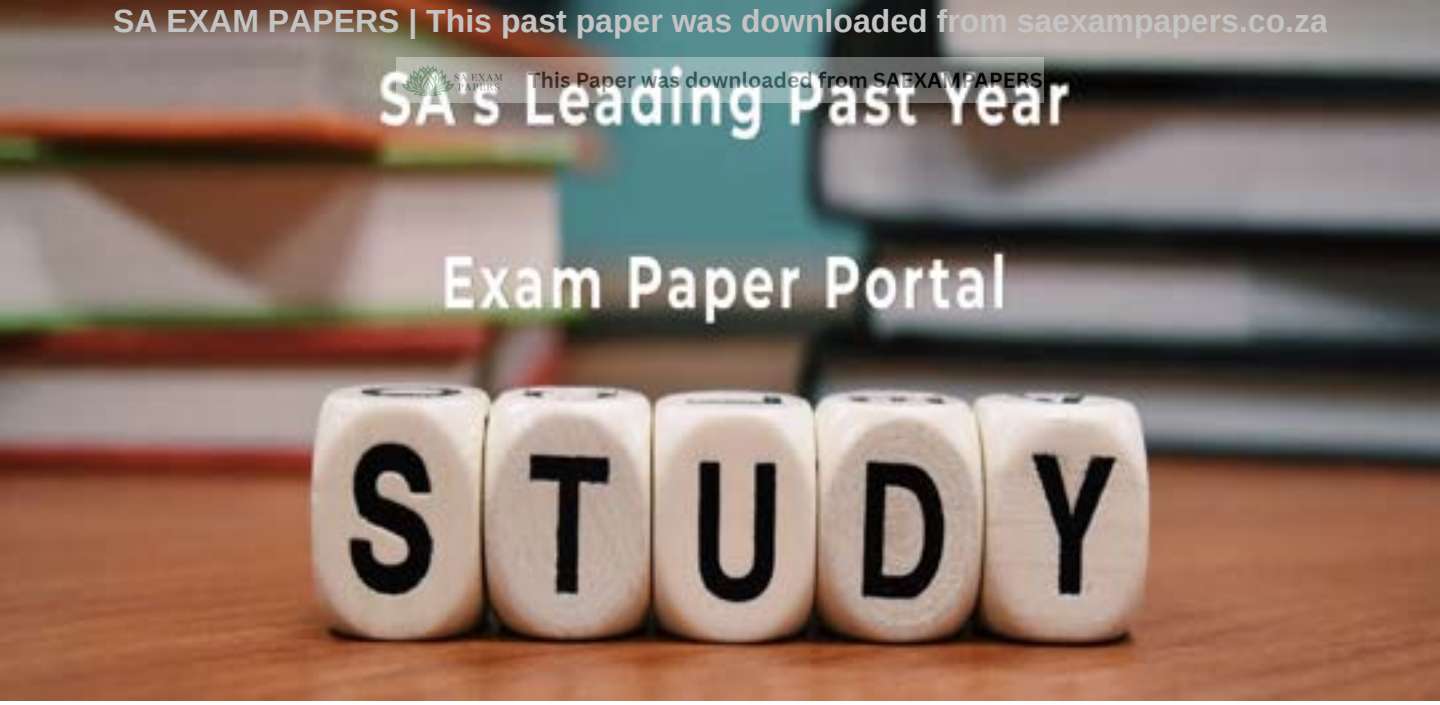


Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

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.

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*

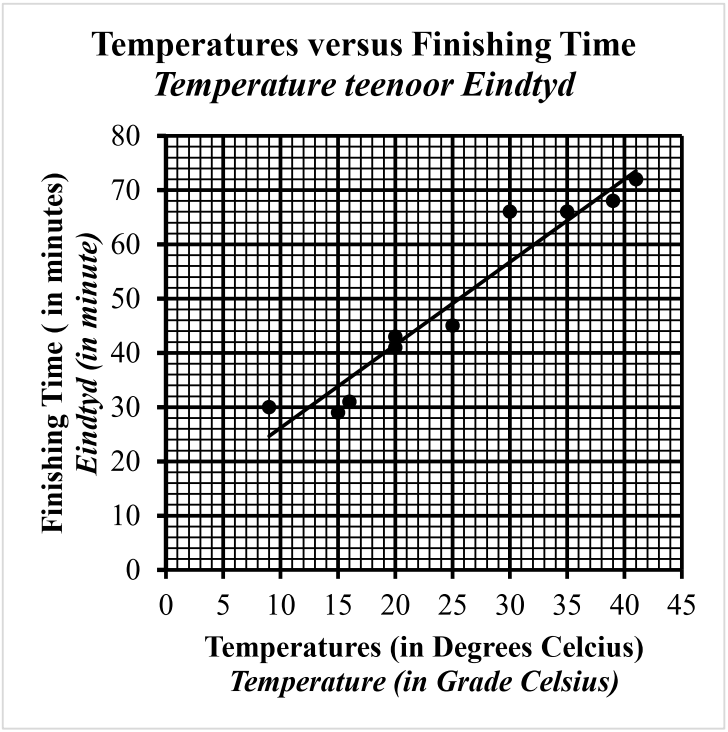
Data Set/*Datastel*:

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

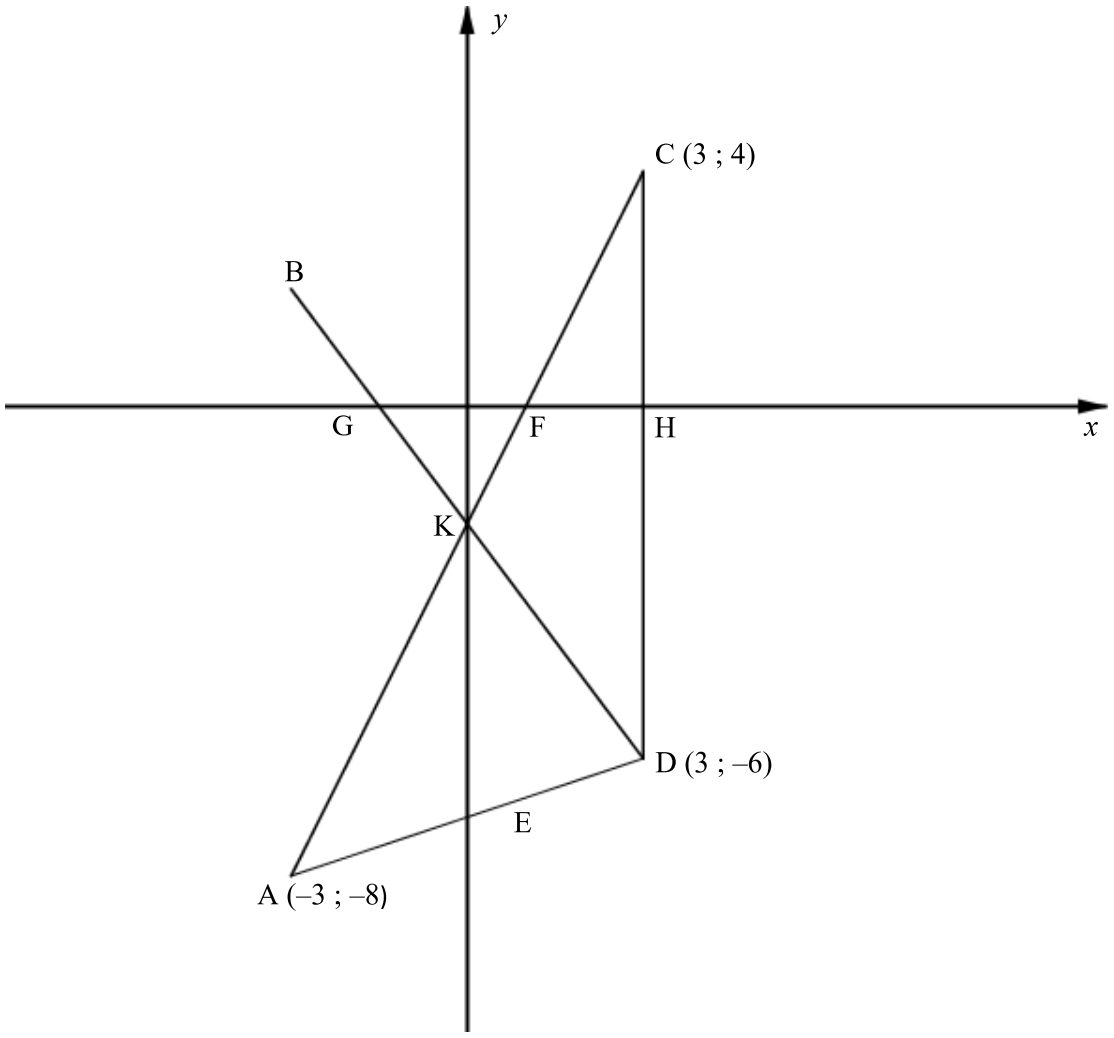
1.1	Mode / *Modus* = 20	✓ answer/*antwoord*	(1)
1.2	$Q_1 = 20$ $Q_3 = \frac{22t+2}{2} = 11t+1$ $IQR = Q_3 - Q_1$ $14 = 11t + 1 - 20$ $\therefore t = 3$	✓ Q_1 ✓ $Q_3 = 11t+1$ ✓ answer/*antwoord*	(3)
1.3	$\bar{x} = \frac{444}{16}$ $\therefore = 27,75$ (Answer only full marks/*Slegs antwoord – volpunte*)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

QUESTION/*VRAAG 2*

Years / *Jaar*	1	2	3	4	5	6	7	8	9	10
Temperatures (degrees Celsius) x *Temperature (grade Celsius)* x	41	9	30	15	25	20	20	35	39	16
Finishing times of athletes (in minutes) y *Eindtyd van atleet (in minute)* y	72	30	66	29	45	43	41	66	68	31

2.1	$r = 0{,}96$	✓ answer/*antwoord*	(1)
2.2	Very strong positive correlation *Baie sterk positiewe korrelasie*	✓ very strong positive correlation *Baie sterk positiewe korrelasie*	(1)
2.3	$a = 10{,}92$ $b = 1{,}53$ $y = 10{,}92 + 1{,}53x$	✓ correct value of a *korrekte waarde van a* ✓ correct value of b *korrekte waarde van b* ✓ answer/*antwoord*	(3)
2.4	$57 = 10{,}92 + 1{,}53x$ $x = 30$	✓ substitution/*vervanging* ✓ answer/*antwoord*	(2)
2.5		✓ Any two correct points *Enige twee korrekte punte* ✓ straight line joining points for $x \in [9;41]$ *Reguitlyn verbind punte vir* $x \in [9;41]$	(2)
			[9]

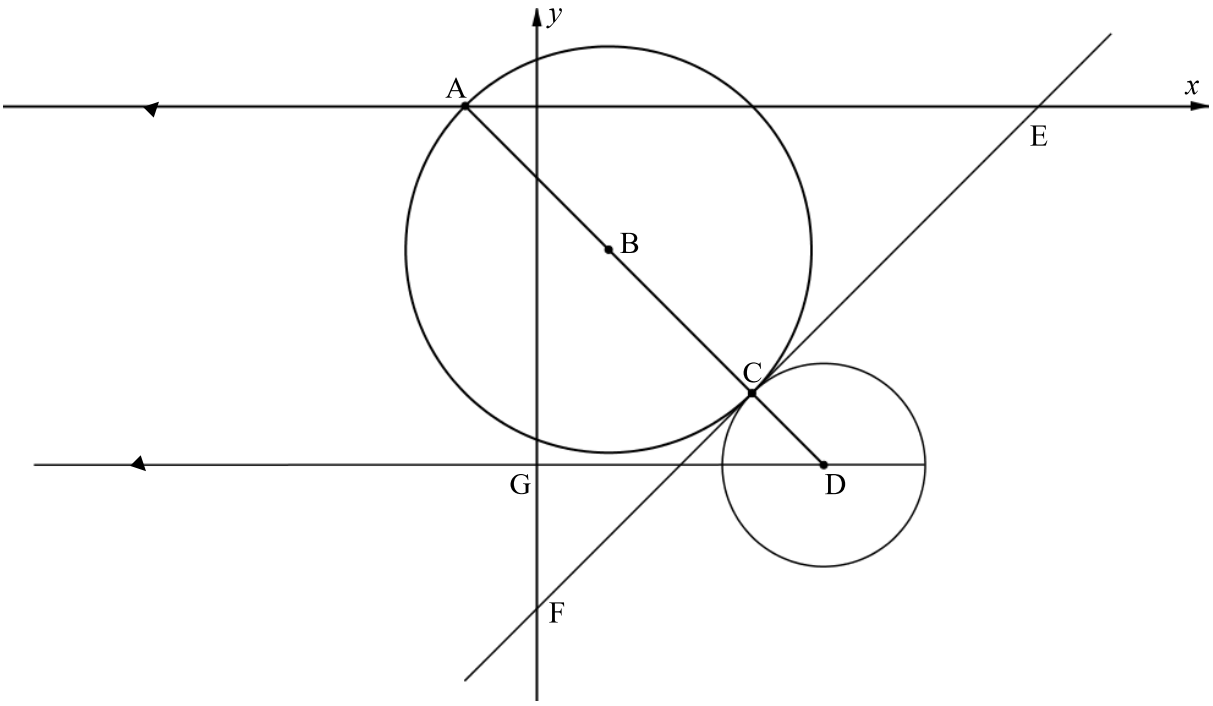
QUESTION/*VRAAG 3*



3.1	$AC = \sqrt{(-3-3)^2(-8-4)^2}$ $= 6\sqrt{5}$	✓ correct substitution/*korrekte vervanging* ✓ correct answer/*korrekte antwoord*	(2)
3.2	$m_{AC} = \frac{4+8}{3+3}$ $= 2$	✓ correct substitution/*korrekte vervanging* ✓ answer/*antwoord*	(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) *vervanging van* m_{AD} en D(3 ; – 6) *of* A(–3 ; –8) ✓ Equation/*Vergelyking*	(3)

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

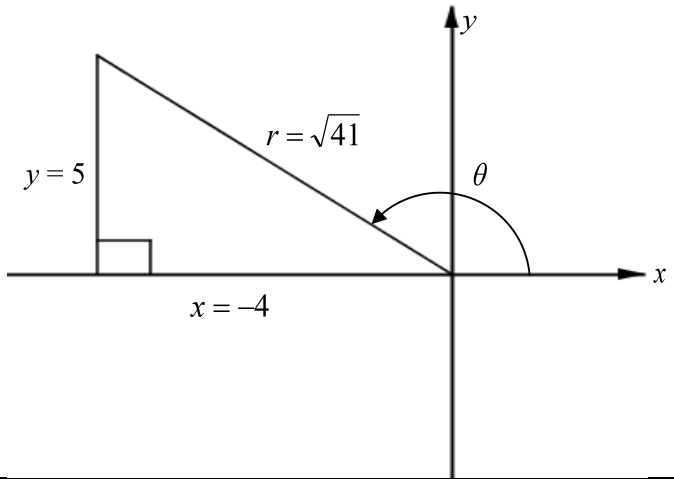
QUESTION/*VRAAG 4*



4.1	$x^2+y^2-2x+4y-3=0$ $(x-1)^2+(y+2)^2=8$ $\therefore B(1;-2)$	✓ completing square *voltooiing van vierkant* ✓ *x*-coordinate/*x-koördinaat* ✓ *y*-coordinate/*y-koördinaat*	(3)
4.2	$x^2+0^2-2x+4.0-3=0$ $x^2-2x-3=0$ $(x-3)(x+1)=0$ $x\neq 3$ *or* $x=1$ $\therefore A(-1\,;\,0)$	✓ $y=0$ ✓ standard form/*standaardvorm* ✓ correct *x*-coordinate *korrekte x-koördinaat*	(3)
4.3	$m_{AB}=\dfrac{-2-0}{1+1}$ $=-1$	✓ substitution into correct formula *vervanging in korrekte formule* ✓ answer/*antwoord*	(2)
4.4	$A\hat{C}E=90^0$ [diameter ⊥ tan / *middellyn ⊥ raaklyn*] $AB=2\sqrt{2}$ *radius* $\therefore\ AC=4\sqrt{2}$ diameter / *middellyn* $CE^2=8^2-\left(4\sqrt{2}\right)^2$ $CE=4\sqrt{2}$	✓ $A\hat{C}E=90^0$ ✓ $AC=4\sqrt{2}$ (diameter / *middellyn*) ✓ correct use of Pyth. Theorem *korrekte gebruik van Pyth. Stel.* ✓ $CE=4\sqrt{2}$	(4)

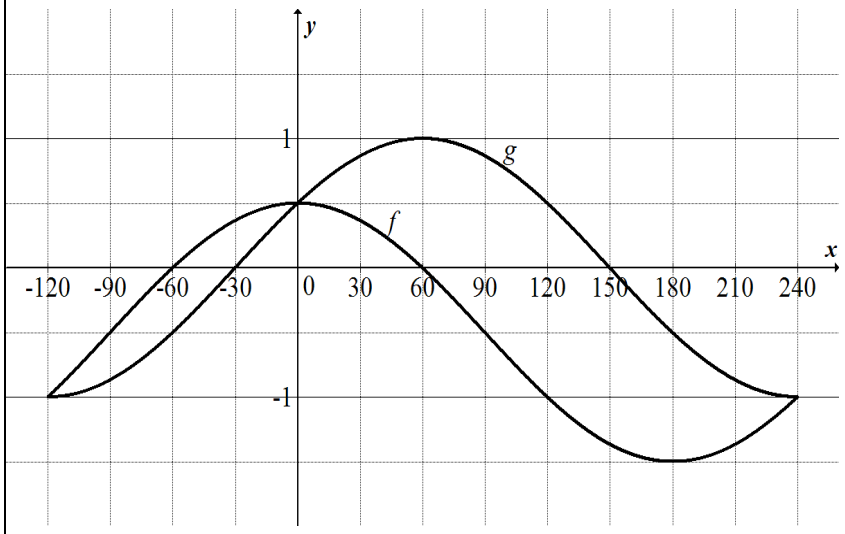
4.5	$D(x;-5)$ $GD \parallel x-axis$ $m_{AD} = m_{AB}$ collinear points/*samelynige punte* $\frac{-5-0}{x+1} = -1$ $-x-1 = -5$ $\therefore x = 4$ $D(4;-5)$ **OR/*OF*** $D(x;-5)$ $GD \parallel x-axis\ /\ -as$ $m_{BD} = m_{AB}$ collinear points / *saamlynige punte* $\frac{-2+5}{1-x} = -1$ $x-1 = 3$ $\therefore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

QUESTION/*VRAAG 5*

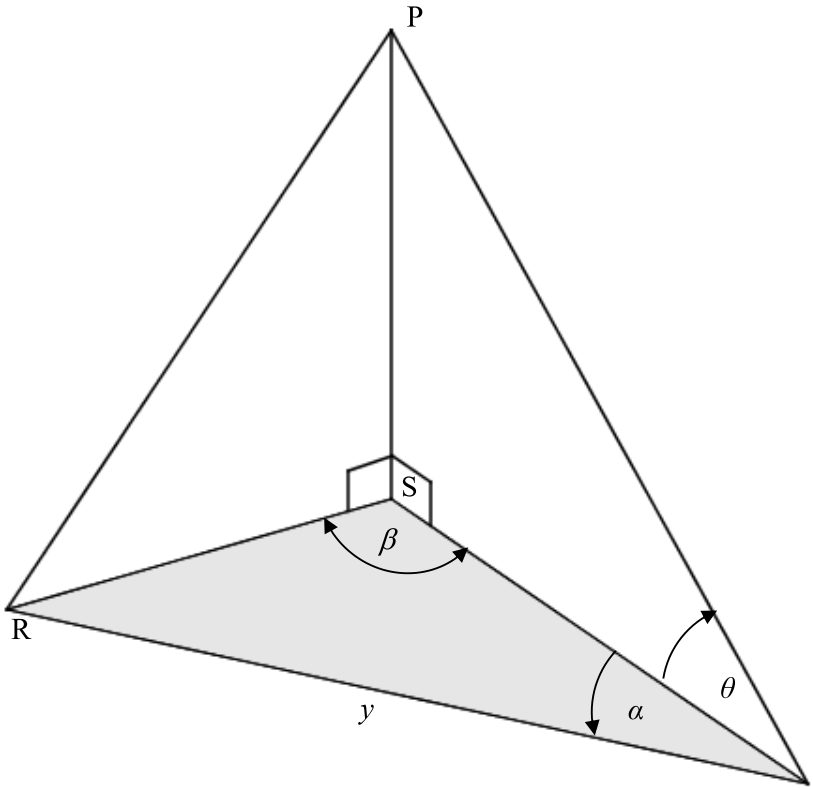
5.1			
5.1.1	$r=\sqrt{3^2+(-4)^2}=5$ $\cos\theta=-\frac{4}{\sqrt{41}}$	✓ value of r / *waarde van r* ✓ answer/*antwoord*	(2)
5.1.2	$2\sin^2\theta=2\left(\frac{5}{\sqrt{41}}\right)^2$ $=\frac{50}{41}$	✓ correct substitution *korrekte vervanging* ✓ correct answer *korrekte antwoord*	(2)
5.1.3	$\cos(90^0-2\theta)=\sin 2\theta$ $=2\sin\theta\cos\theta$ $=2\left(\frac{5}{\sqrt{41}}\right)\left(-\frac{4}{\sqrt{41}}\right)$ $=-\frac{40}{41}$	✓ 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***	
	$\text{LHS}/LK = \dfrac{3\cos 2x + 3\cos^2 x + 9\sin^2 x}{4 - 4\sin^2 x}$ $= \dfrac{3(1-2\sin^2)x + 3(1-\sin^2 x) + 9\sin^2 x}{4(1-\sin^2 x)}$ $= \dfrac{6}{4\cos^2 x}$ $= \dfrac{3}{2\cos^2 x}$	✓ $1-2\sin^2 x$ ✓ $1-\sin^2 x$ ✓ $\cos^2 x$ ✓ $\dfrac{6}{4\cos^2 x}$	(4)
5.3	$\dfrac{\cos x.\cos(90^0 - x)\sin(48^0 - x) + \sin^2 x\cos(48^0 - x)}{\sin(-x).\cos 24^0.\cos 66^0}$ $= \dfrac{\cos x.\sin x\sin(48^0 - x) + \sin^2 x\cos(48^0 - x)}{(-\sin x)\cos 24^0 \sin 24^0}$ $= \dfrac{\sin x[\sin(48^0 - x)\cos x + \sin x\cos(48^0 - x)]}{(-\sin x)\left(\dfrac{\sin 48^0}{2}\right)}$ $= \dfrac{\sin(48^0 - x + x)}{-\dfrac{1}{2}\sin 48^0}$ $= \dfrac{\sin 48^0}{-\dfrac{1}{2}\sin 48^0}$ $= -2$	✓ $\sin x$ ✓ $-\sin x$ ✓ $\sin 24^0$ ✓ taking out common $\sin x$ *uithaal van* $\sin x$ *as gemene faktor* ✓ $\dfrac{1}{2}\sin 48^0$ ✓ compound angle *saamgestelde hoek* ✓ answer/*antwoord*	
	OR/*OF*	**OR/*OF***	
	$\dfrac{\cos x.\cos(90^0 - x)\sin(48^0 - x) + \sin^2 x\cos(48^0 - x)}{\sin(-x).\cos 24^0.\cos 66^0}$ $= \dfrac{\cos x.\sin x\sin(48^0 - x) + \sin^2 x\cos(48^0 - x)}{(-\sin x)\cos 24^0 \sin 24^0}$ $= \dfrac{\sin x[\sin(48^0 - x)\cos x + \sin x\cos(48^0 - x)]}{(-\sin x)\sin 24^0 \cos 24^0}$ $= \dfrac{\sin(48^0 - x + x)}{-\dfrac{1}{2}\sin 48^0}$ $= \dfrac{2\sin 24^0 \cos 24^0}{-\sin 24^0.\cos 24^0}$ $= -2$	✓ $\sin x$ ✓ $-\sin x$ ✓ $\sin 24^0$ ✓ taking out common $\sin x$ $\sin x$ *as gemene faktor* ✓ compound angle *saamgestelde hoek* ✓ $2\sin 24^0 \cos 24^0$ ✓ answer/*antwoord*	(7)

5.4.1	$\left[\cos(60^0 - x) + \cos(x + 60^0)\right]^2$ $= \left[\cos 60^0 \cos x + \sin 60^0 \sin x + \cos x \cos 60^0 - \sin x \sin 60^0\right]^2$ $= \left[2\cos 60^0 \cos x\right]^2$ $= \left[2.\frac{1}{2}\cos x\right]^2$ $= \cos^2 x$	✓ expansion/ *uitbreiding* ✓ simplification *vereenvoudiging* ✓ answer/*antwoord*	(3)
5.4.2	$\cos^2 x = \frac{3}{4}$ $\cos x = \pm\frac{\sqrt{3}}{2}$ $x = \pm 30^0 + 360^0.k$ or / *of* $x = \pm 150^0 + 360^0.k, \quad k \in Z$	✓ $\cos^2 x = \frac{3}{4}$ ✓ $\cos x = \pm\frac{\sqrt{3}}{2}$ ✓ $\pm 30° + 360^0.k, k \in Z$ ✓ $\pm 150° + 360^0.k$	(4)
			[26]

QUESTION/*VRAAG 6*			
6.1	Range/ *Waardeversameling*: $y \in \left[\frac{-3}{2}; \frac{1}{2}\right]$ or/*of* $-\frac{3}{2} \le y \le \frac{1}{2}$	✓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	$x = -120^0$ and/*en* $x = 240^0$	✓✓ each *x*-value/ *elke x-waarde*	(2)
6.4	$0^0 < x < 180^0$	✓ 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]

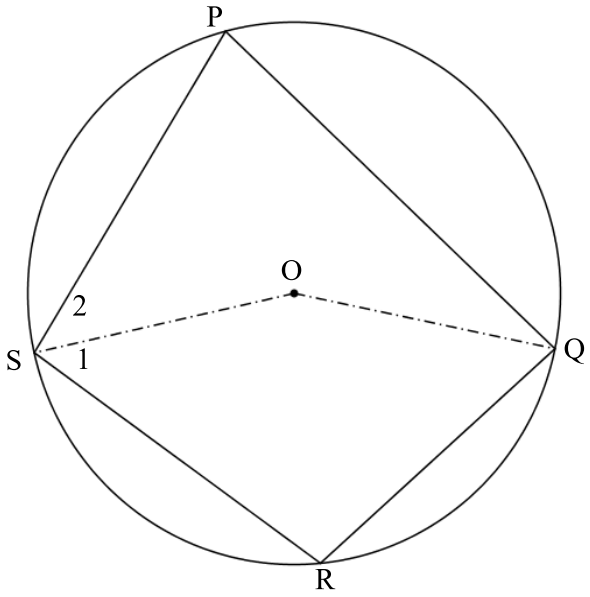
QUESTION/*VRAAG 7*



7.1	$S\hat{R}Q = 180° - (\alpha + \beta)$	✓ answer/*antwoord*	(1)
7.2	$\frac{SQ}{\sin(180° - (\alpha+\beta))} = \frac{y}{\sin\beta}$ $SQ = \frac{y\sin(180° - (\alpha+\beta))}{\sin\beta}$ $SQ = \frac{y\sin(\alpha+\beta)}{\sin\beta}$ $\tan\theta = \frac{PS}{SQ}$ $PS = \tan\theta.SQ$ $PS = \frac{y.\tan\theta.\sin(\alpha+\beta)}{\sin\beta}$	✓ use of sine rule *gebruik van sinusreël* ✓ $\sin(\alpha+\beta)$ reduction/*vermindering* ✓ correct ratio of $\tan\theta$ *korrekte verhouding van* $\tan\theta$	(3)
7.3	$PS = \frac{(116).\tan 57°.\sin(27°+102°)}{\sin 102°}$ PS = 141, 92 units/*eenhede*	✓ substitution/*vervanging* ✓ answer/*antwoord*	(2)

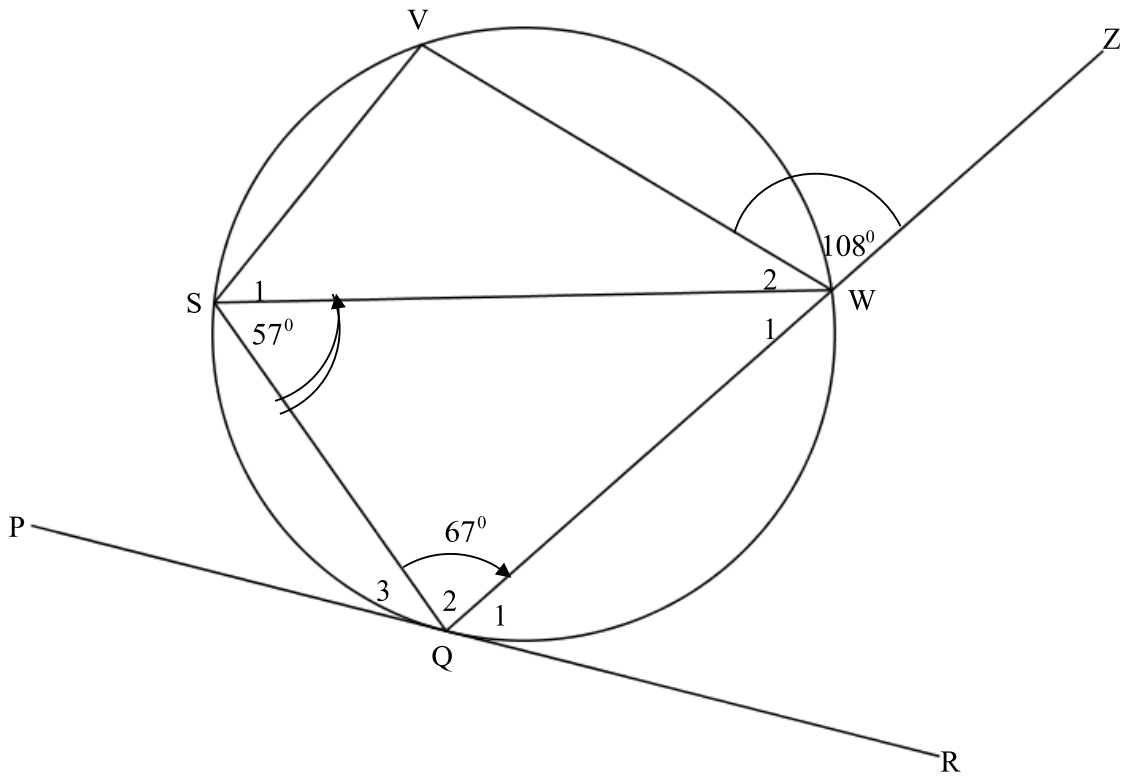
7.4	$\frac{\sin\alpha}{RS} = \frac{\sin\beta}{y}$ $\frac{\sin 27°}{RS} = \frac{\sin 102°}{116}$ $RS = \frac{116\sin 27°}{\sin 102°}$ $RS = 53,84$ units $\tan P\hat{R}S = \frac{PS}{RS}$ $\tan P\hat{R}S = \frac{141,92}{53,84}$ $P\hat{R}S = \tan^{-1}\left(\frac{141,92}{53,84}\right)$ $\therefore PRS = 69,22°$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

QUESTION/*VRAAG 8*



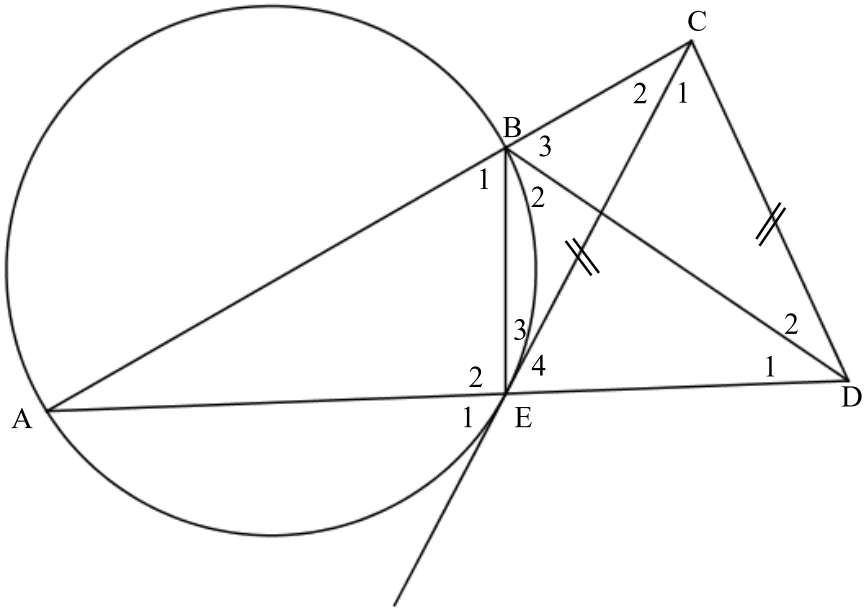
8.1	Constructions: Draw radii OS and OQ *Proof* : $\hat{O}_1 = 2\hat{P}$ $[\angle\ at\ centre = 2\angle\ at\ circumf]$ $\hat{O}_2 = 2\hat{R}$ $[\angle\ at\ centre = 2\angle\ at\ circumf]$ $\hat{O}_1 + \hat{O}_2 = 360^0$ $[\angle s\ around\ a\ point]$ $2\hat{P} + 2\hat{R} = 360^0$ $[Substitution]$ $\hat{P} + \hat{R} = 180^0$	✓ Construction ✓S/R ✓S ✓S/R ✓S	(5)

8.1	*Konstruksies: Teken radiusse* OS *en* OQ *Bewys* : $\hat{O}_1 = 2\hat{P}$ $[Middelpunts\angle = 2\times Omtreks\angle]$ $\hat{O}_2 = 2\hat{R}$ $[Middelpunts\angle = 2\times Omtreks\angle]$ $\hat{O}_1 + \hat{O}_2 = 360^0$ $[\angle' e\ om' n\ punt]$ $2\hat{P} + 2\hat{R} = 360^0$ $[Vervanging]$ $\hat{P} + \hat{R} = 180^0$	✓ *Konstruksie* ✓S/R ✓S ✓S/R ✓S	(5)



8.2.1	$\hat{V} = 113^0$	[opp ∠s of a cyclic quad] [*teenoorst.∠e van koordev.*]	✓ S ✓ R	(2)
8.2.2	$\hat{S}_1 = 51^0$	[ext ∠ of a cyclic quad] [*buite∠ van koordevh*]	✓ S ✓ R	(2)
8.2.3	$W\hat{Q}R = 57°$	[tan – chord theorem] [*raaklyn – koord stelling*]	✓ S ✓ R	(2)
				[11]

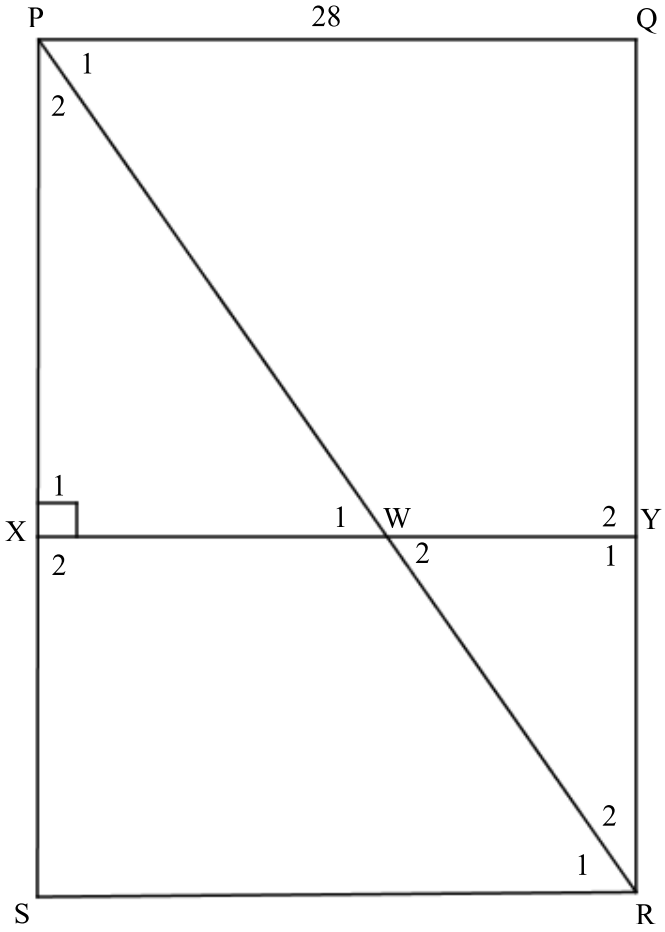
QUESTION/*VRAAG 9*



9.1	$\hat{D} = \hat{E}_4$ [$\angle$s opp = sides] / [$\angle e$ *teenoor* = *sye*] $E_4 = \hat{E}_1$ [vert. opp $\angle$s] / [*regoorst.* $\angle e$] $\hat{E}_1 = \hat{B}_1$ [tan chord theo.] / [*raaklyn - koord stelling*] $\therefore \hat{D} = \hat{B}$ $\therefore$ BCDE is a cyclic quad [converse ext $\angle$ of a cyclic quad] *BCDE is 'n koordevierhoek* [*omgekeerde buite* $\angle$ *van kv*]	✓ S/R ✓ S ✓ S ✓ R ✓ R	(5)
9.2	ΔCEB and/*en* ΔCAE $\hat{E}_3 = \hat{A}$ [tan chord theo]/[*raaklyn - koord stelling*] $\hat{C}_2 = \hat{C}_2$ [common] / [*gemeen*] $E\hat{B}C = A\hat{E}C$ [3rd $\angle$s] / [3*de* $\angle$] $\therefore \Delta CEB \;|||\; \Delta CAE$ [$\angle\angle\angle$]	✓ S/R ✓ S ✓ S **OR/*OF*** ✓ R	(3)
9.3	$\frac{CE}{AC} = \frac{EB}{AE}$ |||Δs/*e* CE = CD [given] / [*gegee*] $CD = \frac{EB.AC}{AE}$	✓ S ✓ R	(2)

9.4	$\hat{D}_2 = \hat{E}_3$ [∠s same seg] / [∠*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 cirle ABD [converse tan chord theo] CD *is 'n raaklyn aan die sirkel* ABD [*omgekeerde raaklyn koord stelling*]	✓ S ✓ R ✓ R	(3)
9.5	ΔBCD and/*en* ΔABE $\hat{E}_2 = \hat{C}$ [ext ∠ of a cyclic quad]/[*buite ∠ van kv*] $\hat{A} = \hat{D}_2$ [tan chord theo] / [*raaklyn - koord stelling*] $\hat{B}_1 = \hat{B}_3$ [3rd ∠] / [3*de* ∠] $\therefore \Delta EAB \ ||| \ \Delta CDB$ [∠∠∠] $\frac{AE}{CD} = \frac{EB}{CB}$ $CD = \frac{AE \times CB}{EB}$ $\therefore \frac{AE \times CB}{EB} = \frac{EB \times AC}{AE}$ [both/*beide* = CD] $\frac{EB^2}{AE^2} = \frac{BC}{AC}$ **OR/*OF*** ΔBCD and/*en* ΔABE $\hat{E}_2 = \hat{C}$ [ext ∠ of a cyclic quad]/[*buite ∠ van kv*] $\hat{A} = \hat{D}_2$ [proved 9.4] / [*bewys in* 9.4] $\hat{B}_1 = \hat{B}_3$ [3rd ∠] / [3*de* ∠] $\therefore \Delta EAB \ ||| \ \Delta CDB$ [∠∠∠] $\frac{AE}{CD} = \frac{EB}{CB}$ $CD \times EB = AE \times CB$ $\left(\frac{EB \times AC}{AE}\right) \times EB = AE \times CB$ 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	$\hat{P} = 90^0$ $\therefore XY \parallel PQ$	$[\angle s \text{ of a rect} = 90^0] / [\angle e\, van\, reghoek = 90^\circ]$ $[\text{co} - \text{int}. \angle s \text{ supp}] / [ko - binne \angle e\, is\, suppl]$	✓ S ✓ R	(2)
10.2	$\frac{WR}{PR} = \frac{YR}{RQ}$ $\frac{WR}{42} = \frac{3x}{7x}$ $\therefore WR = 18$ **OR/*OF*** $\frac{PR}{PW} = \frac{QR}{QY}$ $\frac{42}{PW} = \frac{7x}{4x}$ $\therefore PW = 24$ $\therefore WR = 18$	[prop theo, XY|| PS / line || to one side of a Δ] [*eweredigh stelling*, XY||PS / *lyn* || *aan een sy van* Δ] [prop theo, XY|| PS / line || to one side of a Δ] [*eweredigh stelling*, XY||PS / *lyn* || *aan een sy van* Δ]	✓ S ✓R ✓ correct substitution *korrekte vervanging* ✓ answer/*antwoord* **OR/*OF*** ✓ S ✓R ✓ correct substitution *korrekte vervanging* ✓ answer/*antwoord*	(4)

10.3	$\hat{P}_2 = \hat{P}_2$ [common] / [*gemeen*] $\hat{X}_1 = \hat{S} = 90^0$ [corresp, ∠s, XY|| SR] [*ooreenk. ∠e*, XY|| SR] $\hat{W}_1 = \hat{R}_1$ [3rd ∠s] / [3*de* ∠] $\Delta PXW \ ||| \ \Delta PSR$ [∠∠∠] $\frac{XW}{SR} = \frac{PW}{PR}$ [||| Δs] $SR = 28$ [opp sides of a rect.] [*teenoorst. sye van 'n reghoek*] $\frac{XW}{28} = \frac{24}{42}$ $XW = 16$	✓ S for identifying |||Δs *identifisering van* |||Δs ✓ S ✓ S/R ✓ substitution into correct ratios *vervanging in korrekte verhoudings* ✓ answer / *antwoord*	(5)
			[11]
		TOTAL/*TOTAAL*: 150	