basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 12

MATHEMATICS P2/*WISKUNDE V2*

FEBRUARY/MARCH/*FEBRUARIE/MAART* 2018

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

These marking guidelines consist of 22 pages./
Hierdie nasienriglyne 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 the question, mark the crossed out version.
- Consistent accuracy applies in ALL aspects of the marking guidelines. Stop marking at the second calculation error.
- Assuming answers/values in order to solve a problem is NOT acceptable.

NOTA:
- *As 'n kandidaat 'n vraag TWEE KEER beantwoord, merk slegs die EERSTE poging.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek en nie oordoen nie, merk die doodgetrekte poging.*
- *Volgehoue akkuraatheid word in ALLE aspekte van die nasienriglyne toegepas. Hou op nasien by die tweede berekeningsfout.*

Aanvaar van antwoorde/waardes om 'n probleem op te los, word NIE toegelaat nie.

GEOMETRY	
S	**A mark for a correct statement** **(A statement mark is independent of a reason.)**
	'n Punt vir 'n korrekte bewering **('n Punt vir 'n bewering is onafhanklik van die rede.)**
R	**A mark for a 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 the statement AND reason are both correct.**
	Ken 'n punt toe as beide die bewering EN rede korrek is.

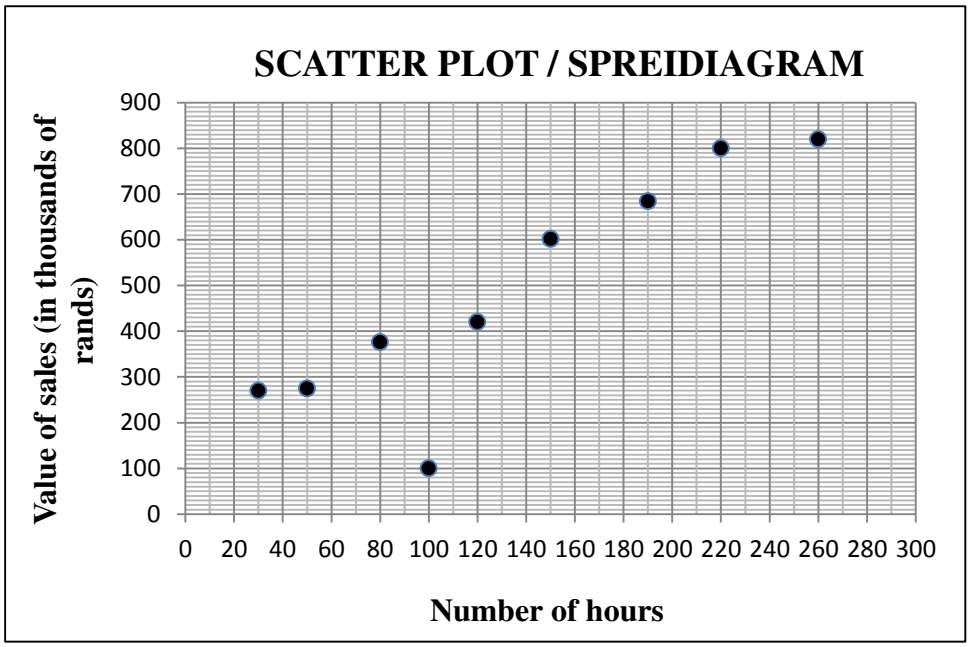
QUESTION/*VRAAG* 1

Days/*Dae*	1	2	3	4	5	6	7	8	9	10
Units of blood/ *Eenhede bloed*	45	59	65	73	79	82	91	99	101	106

1.1.1	$\bar{x} = \frac{800}{10}$ $= 80$ Answer only: full marks	✓ 800 (addition of units) ✓ answer (CA if ÷ 10) (2)
1.1.2	$\sigma = 18{,}83$ No penalty for rounding	✓✓ answer (A) (2)
1.1.3	$(61{,}17\,;98{,}83)$ Days 1, 2, 8, 9 and 10 lie outside 1 standard deviation from the mean $\therefore$ 5 days Correct answer only: full marks provided that 1.1.1. & 1.1.2 both correct	✓ mean – 1 SD ✓ mean + 1 SD ✓ answer (3)
1.2.1	Skewed to the left or negatively skewed/ *Skeef na links of negatief skeef*	✓ answer (1)
1.2.2	A = 65 B = 99 Answers without labelling: 1/2	✓ answer ✓ answer (2)
1.3	New total = 95 × 10 = 950 $\therefore$ Units not counted = 950 – 800 = 150	✓ answer (CA from 1.1.1) (1) **[11]**

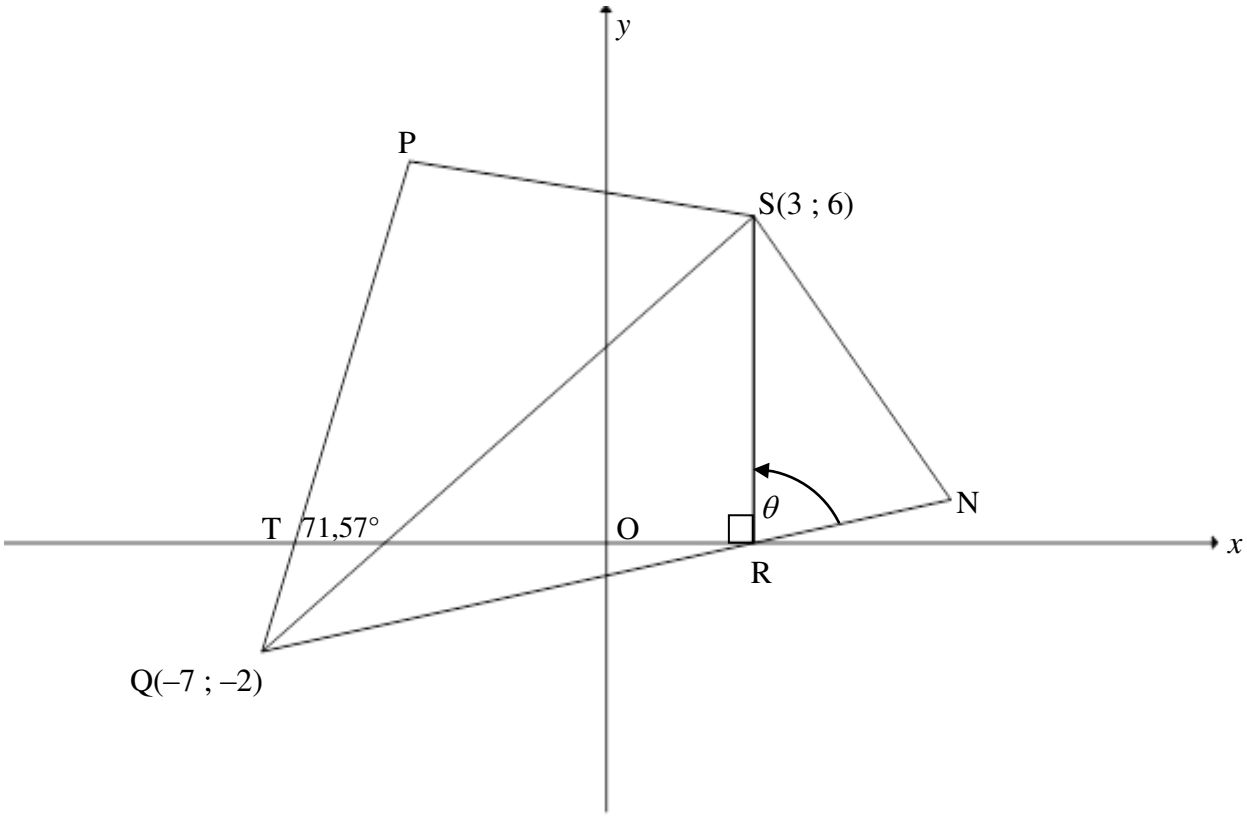
QUESTION/*VRAAG* 2

Number of hours **Aantal uur**	30	50	80	100	120	150	190	220	260
Value of sales (in thousands of rands) **Waarde van verkope (in duisend rand)**	270	275	376	100	420	602	684	800	820

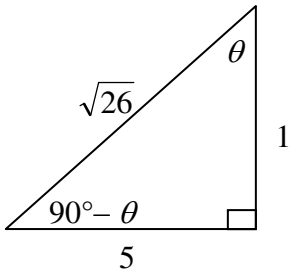
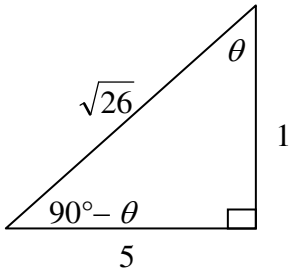


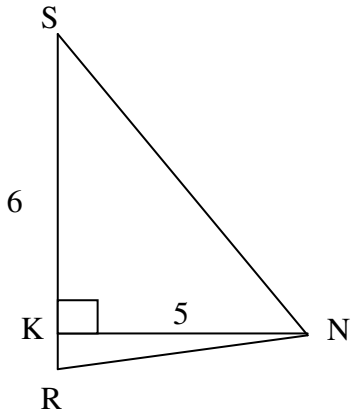
2.1	Outlier/*Uitskieter*: (100 ; 100)	accept: 100 as answer	✓ answer (1)
2.2	$a = 94{,}50273\ldots$ $b = 2{,}913729\ldots$ $\hat{y} = 94{,}50 + 2{,}91x$	Integral values: max 2/3 Swopped a and b: 2/3	✓ value of a ✓ value of b ✓ equation (3)
2.3	$\hat{y} = 2{,}91(240) + 94{,}50$ (CA from 2.1) $= 792{,}90$ Value = R793 000 **OR/*OF*** $\hat{y} = 793{,}7978142$ (calculator) Value = R794 000	Penalise 1 mark if answer not in thousands of Rands	✓ substitution ✓ answer in thousands of Rands (2) ✓✓ answer in thousands of Rands (2)
2.4	$b = 2{,}913729\ldots$ ∴ R2 914 **OR/*OF*** R2 910 (calculator)	Answer only: full marks	✓ value of b ✓ answer (2) **[8]**

QUESTION/*VRAAG* 3

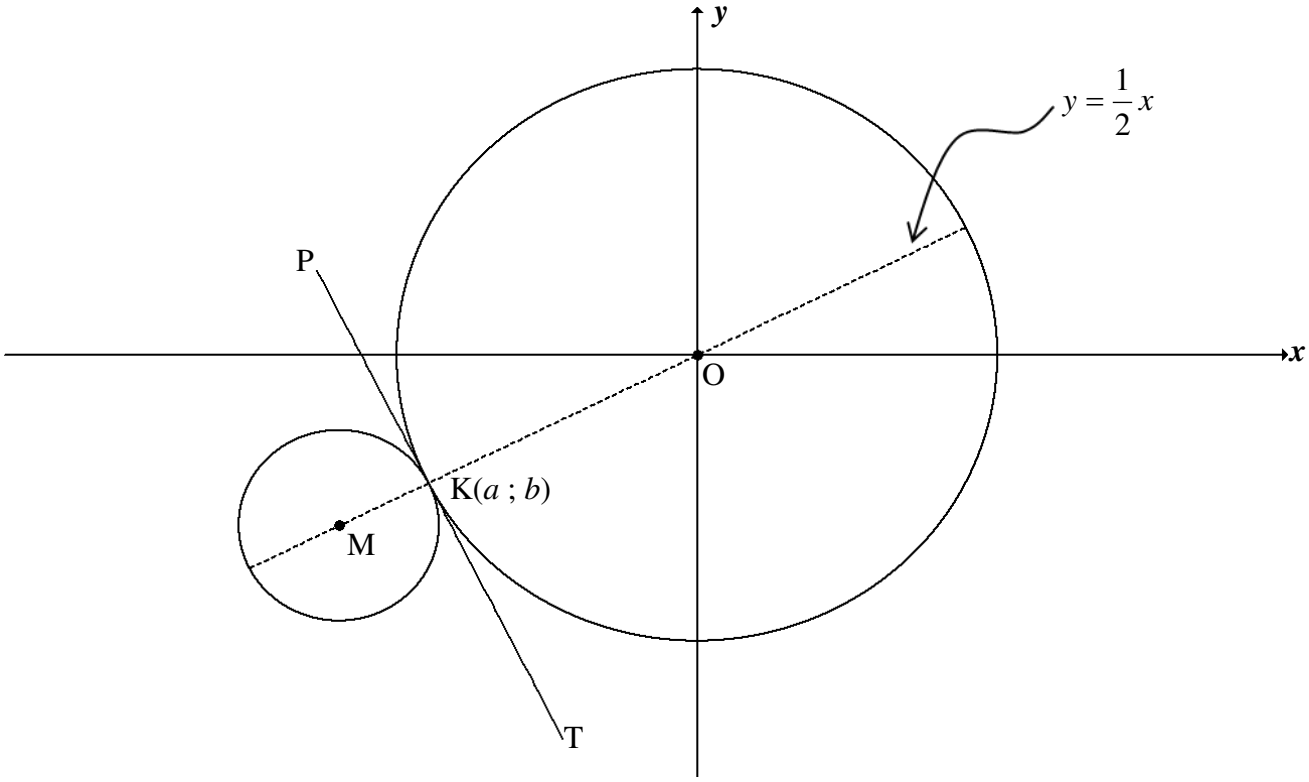


3.1	$x = 3$	✓ answer (1)
3.2	$m_{QP} = \tan 71{,}57°$ $= 3$ Answer only: full marks	✓ $m_{QP} = \tan 71{,}57°$ ✓ answer (2)
3.3	$y = mx + c$ or $y - y_1 = m(x - x_1)$ $-2 = 3(-7) + c$ or $y + 2 = 3(x + 7)$ $y = 3x + 19$	(*m* CA from 3.2 if > 0) ✓ substitution of *m* & Q ✓ equation (2)
3.4	R(3 ; 0) $QR = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(-7 - 3)^2 + (-2 - 0)^2}$ $= \sqrt{104}$ or $2\sqrt{26}$	(wrong R: CA if $x > 0$) ✓ substitution ✓ answer (in surd form) (2)

3.5	$\tan(90° - \theta) = m_{QR}$ $= \frac{0-(-2)}{3-(-7)}$ $= \frac{1}{5}$ Answer only: full $\tan\theta = \frac{1}{5}$: 1/3	(wrong R: CA if $x > 0$) ✓ gradient of QR/RN/QN ✓ substitution of Q & R ✓ answer (3)
3.6	$RN = \frac{1}{2}.2\sqrt{26} = \sqrt{26}$ $SR = 6$  Area $\Delta RSN = \frac{1}{2}$ SR . RN. $\sin\theta$ $= \frac{1}{2} \times 6 \times \sqrt{26} \times \frac{5}{\sqrt{26}}$ = 15 square units **OR/*OF*** $RN = \frac{1}{2}.2\sqrt{26} = \sqrt{26}$ $SR = 6$  Area $\Delta RSN = \frac{1}{2}$ SR . RN. $\sin\theta$ $= \frac{1}{2}(6)(\frac{1}{2}QP).\sin\theta$ $= \frac{3}{2}(\sqrt{104}).\sin\theta$ $= \frac{3}{2}(\sqrt{104})\left(\frac{5}{\sqrt{26}}\right)$ = 15 square units **using calculator: max 4 marks**	✓ RN ✓ SR ✓ diagram (5 & $\sqrt{26}$) ✓ use of correct area rule ✓ substitution of $\sin\theta$ ✓ answer (6) ✓ RN ✓ SR ✓ diagram ✓ use of correct area rule ✓ substitution of $\sin\theta$ ✓ answer (6)

	OR/*OF*	
	SR = 6 ⊥height = 5	✓ SR ✓✓ ⊥ height
		
	A = $\frac{1}{2}$ SR ×⊥h = $\frac{1}{2}$ (6)(5) = 30 square units	✓ use of correct area formula ✓ substitution of $\sin\theta$ ✓ answer (6)
	Using A = $\frac{1}{2}$ b×⊥h incorrectly: max 1/6	
		[16]

QUESTION/*VRAAG* 4



4.1	$OK = \sqrt{180}$ or $6\sqrt{5}$	✓ answer (1)
4.2	$a^2 + b^2 = 180$ $b = \frac{1}{2}a$ $a^2 + \left(\frac{1}{2}a\right)^2 = 180$ $a^2 + \frac{1}{4}a^2 = 180$ $a^2 = 144 \quad \therefore a = -12$ $b = \frac{1}{2}(-12)$ K (–12 ; – 6) (given) **OR/*OF*** $a^2 + b^2 = 180$ $a = 2b$ $(2b)^2 + b^2 = 180$ $5b^2 = 180$ $b^2 = 36 \quad \therefore b = -6$ $a = 2(-6)$ K (–12 ; – 6) (given)	No penalty if *x* and *y* are not converted to *a* and *b* Error in simplification: max 2/4	✓ *b* in terms of *a* ✓ substitution ✓ $a^2 = 144$ ✓ substitution (4) ✓ *a* in terms of *b* ✓ substitution ✓ $b^2 = 36$ ✓ substitution (4)

4.3.1

$m_{OK} = \frac{1}{2}$ $[y = \frac{1}{2}x]$

$m_{PT} = -2$ [radius ⊥ tangent/*raaklyn*]

$y = mx + c$ **OR/*OF*** $y - y_1 = m(x - x_1)$

$-6 = -2(-12) + c$ $y - (-6) = -2(x - (-12))$

$c = -30$ $c = -30$

$y = -2x - 30$

Using $m = \frac{1}{2}$: 0/3

Using $m = -\frac{1}{2}$ *or* 2: 2/3

✓ $m_{PT} = -2$

✓ substitution of m & K(–12 ; – 6)

✓ equation

(3)

4.3.2

3MK = OK

$\Rightarrow$OM = $\frac{4}{3}$OK

$M = \frac{4}{3}(-12;-6)$

$\therefore$M(–16 ; –8)

Answer only: 0/6

✓ 3MK = OK

✓ OM = $\frac{4}{3}$OK

✓✓ $M = \frac{4}{3}(-12;-6)$

✓ *x*-coordinate

✓ *y*-coordinate

(6)

OR/*OF*

3MK = OK

$9MK^2 = OK^2 = 180$

$\therefore MK^2 = 20$

Let M(x ; y), then :

$(x+12)^2 + (y+6)^2 = 20$

$(x+12)^2 + \left(\frac{1}{2}x + 6\right)^2 = 20$

$x^2 + 24x + 144 + \frac{1}{4}x^2 + 6x + 36 = 20$

$\frac{5}{4}x^2 + 30x + 160 = 0$

$x^2 + 24x + 128 = 0$

$(x+16)(x+8) = 0$

$x = -16$ $x \neq -8$ [since M is outside the large circle]

$y = -8$

M(–16 ; – 8)

✓ 3MK = OK

✓ $MK^2 = 20$

✓ equation

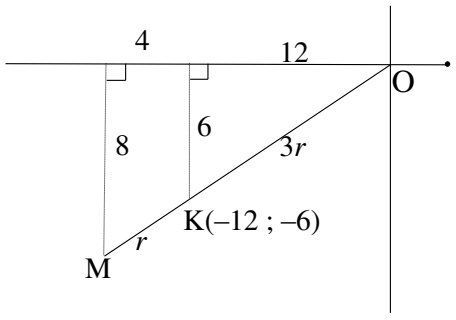
✓ substitution

✓ *x*-coordinate

✓ *y*-coordinate

(6)

OR/*OF*



$\therefore$M(–16 ; –8)

✓ 3MK = OK

✓✓ diagram with values **OR** valid explanation

✓ *x*-coordinate

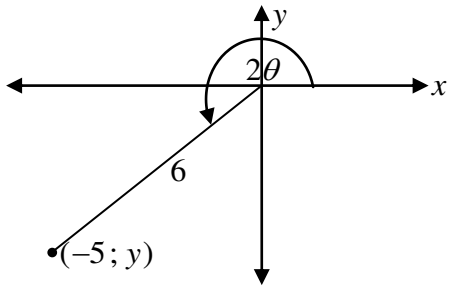
✓ *y*-coordinate

(6)

OR/*OF*

	3MK = OK $9MK^2 = OK^2 = 180$ $\therefore MK^2 = 20$ Let M(x ; y), then $y = \frac{1}{2}x$: $(x+12)^2 + (y+6)^2 = 20$ $(x+12)^2 + \left(\frac{1}{2}x+6\right)^2 = 20$ $4(x+12)^2 + (x+12)^2 = 80$ $(x+12)^2 = 16$ $x+12 = \pm 4$ $x = -16 \quad x \neq -8$ [since M is outside the large circle] $y = -8$ M$(-16;-8)$	✓ 3MK = OK ✓ $MK^2 = 20$ ✓ equation ✓ substitution ✓ x-coordinate ✓ y-coordinate (6)
4.3.3	$(x-(-16))^2 + (y-(-8))^2 = \left(\frac{1}{3}\sqrt{180}\right)^2$ $(x+16)^2 + (y+8)^2 = 20$	✓ LHS (CA from 4.3.2) ✓ RHS (CA from 4.1) (2)
4.4	$OK < r < OK + 2KM$ $\sqrt{180} < r < \sqrt{180} + \frac{2}{3}\sqrt{180}$ Answer only: full marks (No need to simplify) $6\sqrt{5} < r < 10\sqrt{5}$	✓✓ values ✓ inequality (3)
4.5	$x^2 + 32x + (16)^2 + y^2 + 16y + (8)^2 = 256 + 64 - 240$ $(x+16)^2 + (y+8)^2 = 80$ New circle/*nuwe sirkel*: Centre/*middelpt* $(-16;-8)$ & $r = 4\sqrt{5}$ Original circle/*oorspronklike sirkel*: M$(-16;-8)$ & $r = 2\sqrt{5}$ This circle will never cut the circle with centre M as they have the **same centre (concentric circles) but unequal radii/***Hierdie sirkel sal nooit die sirkel met middelpt M sny nie, want hulle is* ***konsentries, want het dieselfde middelpunt met verskillende radii****.*	✓ equation in centre, radius form ✓ Centre: $(-16;-8)$ ✓ $r = 4\sqrt{5}$ (new) ✓ $r = 2\sqrt{5}$ (original) ✓ conclusion ("concentric" must be stated) (5) **[24]**

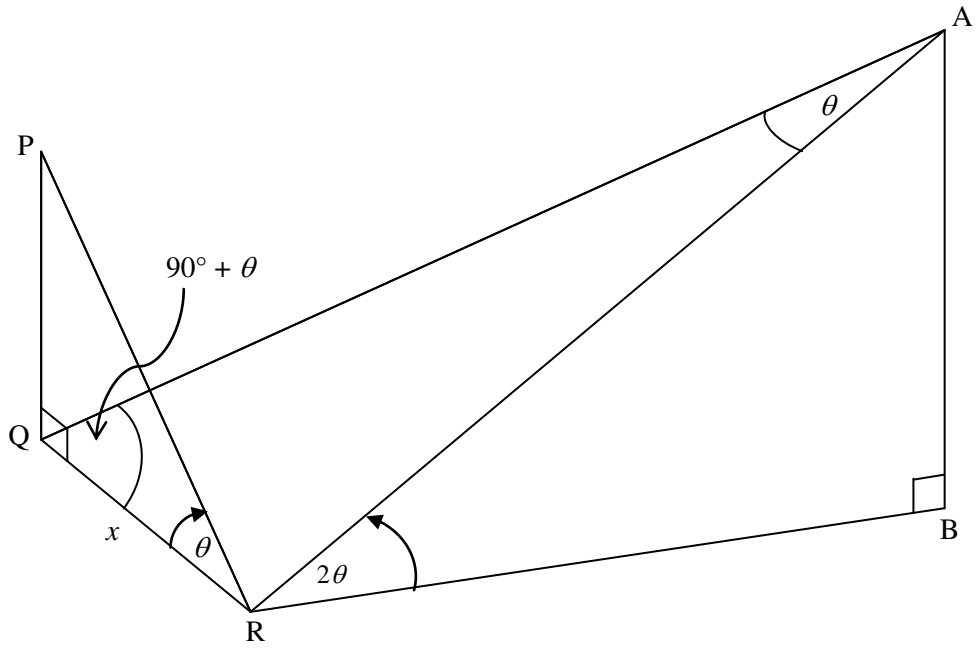
QUESTION/*VRAAG* 5

5.1.1 **no calculator in 5.1**	$\cos 2\theta = -\frac{5}{6}$, where $2\theta \in [180°; 270°]$  $y^2 = 6^2 - (-5)^2$ [Pythagoras] $y = \pm\sqrt{11}$ (5 ; *y*) is in 3rd quadrant: $\therefore\ y = -\sqrt{11}$ $\sin 2\theta = -\frac{\sqrt{11}}{6}$ **OR/*OF*** $\sin^2 2\theta = 1 - \cos^2 2\theta$ $= 1 - \left(-\frac{5}{6}\right)^2$ $= 1 - \frac{25}{36}$ $= \frac{11}{36}$ $\sin 2\theta = -\frac{\sqrt{11}}{6}$	✓ diagram (3rd quadrant only) ✓ using Pythagoras ✓ *y* – value ✓ answer (4) Getting to $\sin 2\theta = \frac{\sqrt{11}}{6}$: 3/4 .✓ $\sin^2 2\theta = 1 - \cos^2 2\theta$ ✓ substitution ✓ value of $\sin^2 2\theta$ ✓ answer (4)
5.1.2	$\cos 2\theta = 1 - 2\sin^2\theta$ $2\sin^2\theta = 1 - \cos 2\theta$ $\sin^2\theta = \frac{1 - \left(-\frac{5}{6}\right)}{2}$ $= \frac{11}{6} \times \frac{1}{2}$ $= \frac{11}{12}$	✓ $\cos 2\theta = 1 - 2\sin^2\theta$ ✓ substitution ✓ answer (3)

5.2	$\sin(180°-x).\cos(-x)+\cos(90°+x).\cos(x-180°)$ $=\sin x.\cos x-\sin x(-c$ $=2\sin x.\cos x$ $=\sin 2x$ Second line written as $\sin x\cos x+\sin x\cos x$: max 5/6	✓ $\sin x$ ✓ $\cos x$ ✓ $-\sin x$ ✓ $-\cos x$ ✓ simplification ✓ answer (6)
5.3	$\sin 3x.\cos y+\cos 3x.\sin y$ $\sin(3x+y)$ $=\sin 270°$ $=-1$	✓ compound angle ✓ answer (2)
5.4.1	$2\cos x=3\tan x$ $2\cos x=\dfrac{3\sin x}{\cos x}$ $2\cos^2 x=3\sin x$ $2(1-\sin^2 x)=3\sin x$ $2-2\sin^2 x=3\sin x$ $2\sin^2 x+3\sin x-2=0$	✓ $\tan x=\dfrac{\sin x}{\cos x}$ ✓ multiplying by $\cos\theta$ ✓ $\cos^2 x=1-\sin^2 x$ (3)
5.4.2	$2\sin^2 x+3\sin x-2=0$ $(2\sin x-1)(\sin x+2)=0$ $\sin x=\dfrac{1}{2}$ or $\sin x=-2$ (no solution) $x=30°+k.360°$ or $x=150°+k.360°$; $k\in Z$	✓ factors ✓ both values of $\sin x$ ✓ no solution ✓ $30°+k.360°$ ✓ $150°+k.360°$; $k\in Z$ (5)
5.4.3	$5y=30°+k.360°$ or $5y=150°+k.360°$ $y=6°+k.72°$ or $y=30°+k.72°$ $\therefore y=144°+6°$ or $y=144°+30°$ $y=150°$ or $y=174°$ **OR/*OF*** $144°\le y\le 216°$ $720°\le 5y\le 1080°$ $5y=750°$ or $5y=870°$ $y=150°$ or $y=174°$	✓ $y=6°+k.72°$ ✓ $y=30°+k.72°$ ✓ 150° ✓ 174° (4) ✓ $5y=750°$ ✓ $5y=870°$ ✓ 150° ✓ 174° (4)
5.5.1	$g(x)=-4\cos(x+30°)$ maximum value = 4	✓ answer (1)

5.5.2	range of/*waardeversameling van* $g(x)$: $-4 \le y \le 4$ **OR/*OF*** $y \in [-4 ; 4]$ $\therefore$ range of/*waardeversameling van* $g(x) + 1$: $-3 \le y \le 5$ **OR/*OF*** $y \in [-3 ; 5]$ Answer only: full marks	✓ range of $g(x)$ ✓ answer (2)
5.5.3	$y = -4\cos(x + 30°)$ shifted to the left/*skuif na links*: $y = -4\cos(x + 30° + 60°)$ $= -4\cos(x + 90°)$ $= 4\sin x$ $\therefore h(x) = -4\sin x$ Answer only: full marks	✓ shift of 60° to the left ✓ reduction ✓ equation of h (3) **[33]**

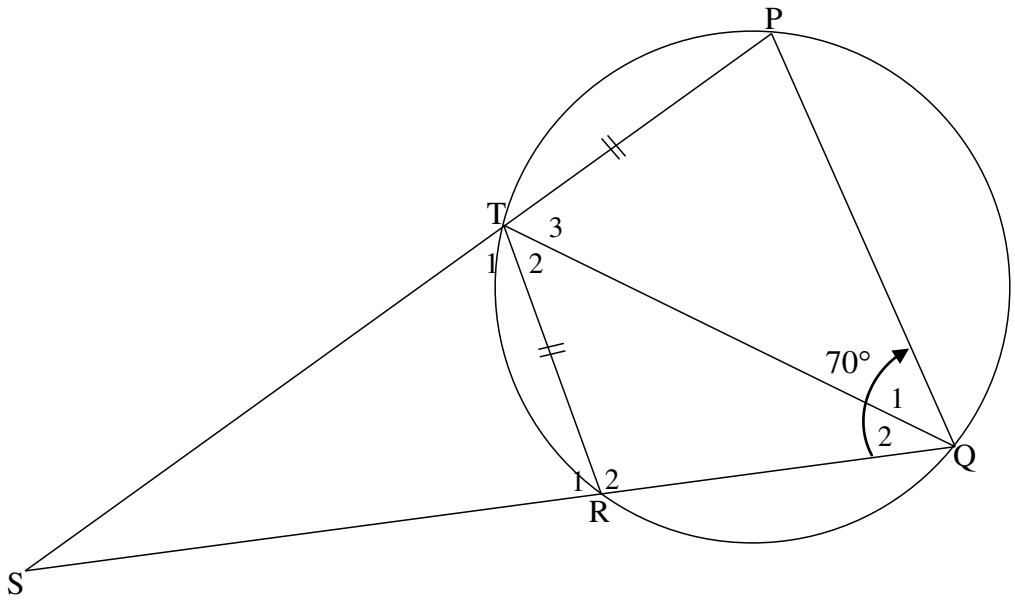
QUESTION/*VRAAG* 6



6.1.1	$\tan\theta = \frac{PQ}{QR} = \frac{PQ}{x}$ $\therefore PQ = x\tan\theta$ **OR/*OF*** $\frac{QR}{\sin P} = \frac{PQ}{\sin P\hat{R}Q}$ $\therefore PQ = \frac{x.\sin\theta}{\sin(90° - \theta)}$	Answer only: full marks	✓ trig ratio ✓ answer (2) ✓ trig ratio ✓ answer (2)
6.1.2	$\frac{AR}{\sin A\hat{Q}R} = \frac{QR}{\sin Q\hat{A}R}$ $AR = \frac{x\sin(90° + \theta)}{\sin\theta}$	Answer only: full marks	✓ use of sine rule ✓ substitution into sine rule correctly (2)

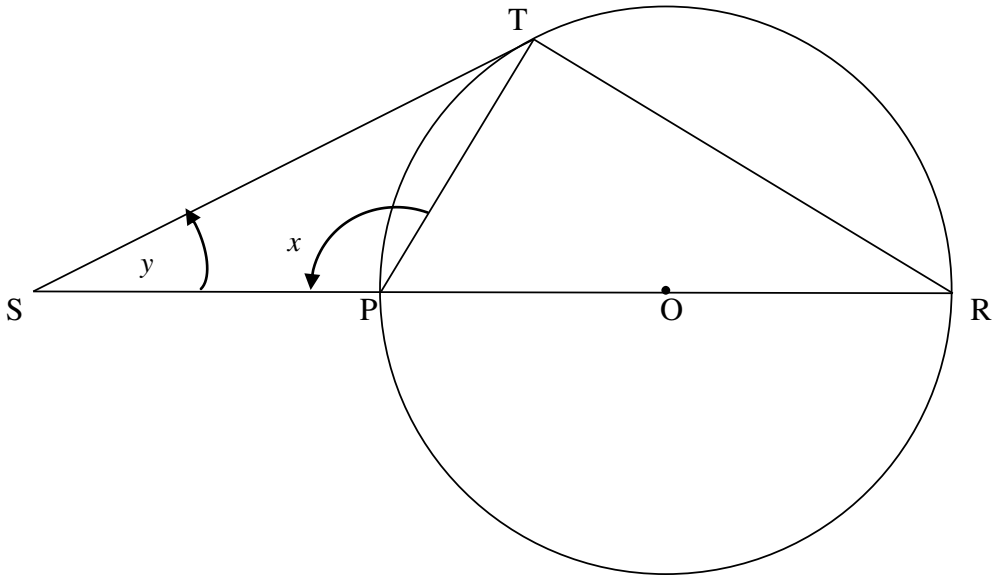
6.2	$\sin 2\theta = \frac{AB}{AR}$ $AB = AR\sin 2\theta$ $= \frac{x\sin(90° + \theta).\sin 2\theta}{\sin\theta}$ $= \frac{x\cos\theta.\sin 2\theta}{\sin\theta}$ $= \frac{x\cos\theta.2\sin\theta\cos\theta}{\sin\theta}$ $= 2x\cos^2\theta$	✓ substitution into trig ratio and AB as subject ✓ substitution of AR ✓ co-ratio ✓ $\sin 2\theta = 2\sin\theta\cos\theta$ (4)
6.3	$\frac{AB}{QP} = \frac{2x\cos^2 12°}{x\tan 12°}$ $= 9$	✓ substitution CA from 6.1.1) ✓ answer (2) **[10]**

QUESTION/*VRAAG* 7



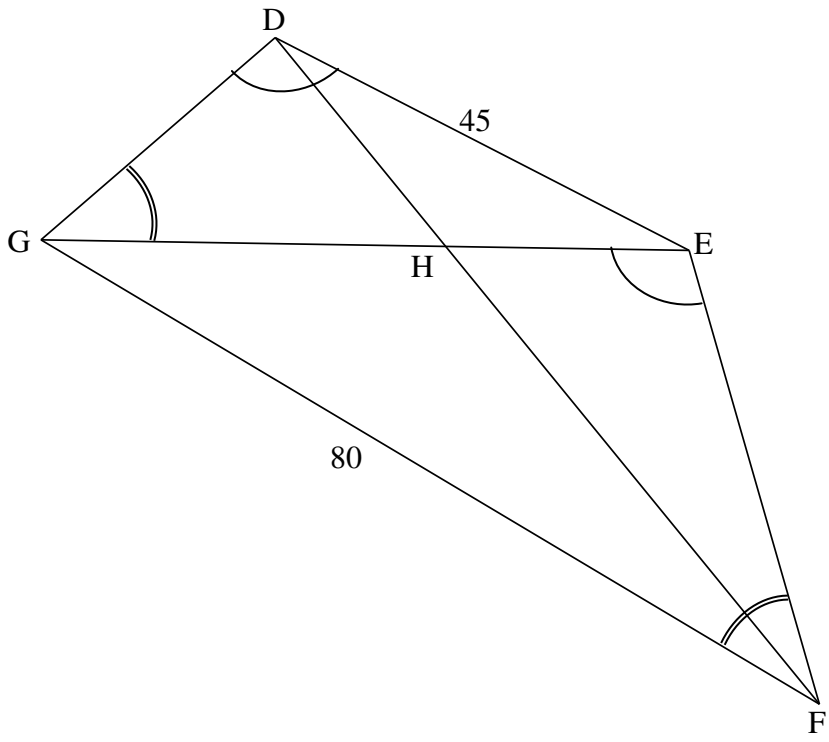
7.1.1	$\hat{T}_1 = 70°$	[ext ∠ of cyclic quad/*buite ∠ van koordevh*]	✓ S ✓ R (2)
7.1.2	$\hat{Q}_1 = \hat{Q}_2 = 35°$	[equal chords;equal∠s/*gelyke koorde; gelyke∠e*]	✓ S ✓ R (2)
7.2.1	$\hat{T}_2 = \hat{Q}_1 = 35°$	[alt ∠s/*verwiss ∠e*; PQ ‖ TR]	✓ S ✓ R (2)
7.2.2	$\frac{PT}{TS} = \frac{QR}{RS}$ $\therefore \frac{TR}{TS} = \frac{QR}{RS}$	[prop theorem/*eweredighst*; PQ ‖ TR] [PT = TR]	✓ S ✓ R (2) **[8]**

QUESTION/*VRAAG* 8



	$P\hat{T}R = 90°$	[$\angle$ in semi-circle/*halfsirkel*]	✓ S/R
	$x = 90° + \hat{R}$	[ext/*buite* $\angle$ of/*van* Δ]	✓ S/R
	$\therefore \hat{R} = x - 90°$		
	$S\hat{T}P = x - 90°$	[tan chord theorem/*raakl koordstelling*]	✓ S ✓R
	$x + x - 90° + y = 180°$	[sum of/*som van* $\angle$s/*e* in Δ]	✓ S
	$\therefore\ y = 270° - 2x$		✓ answer **[6]**

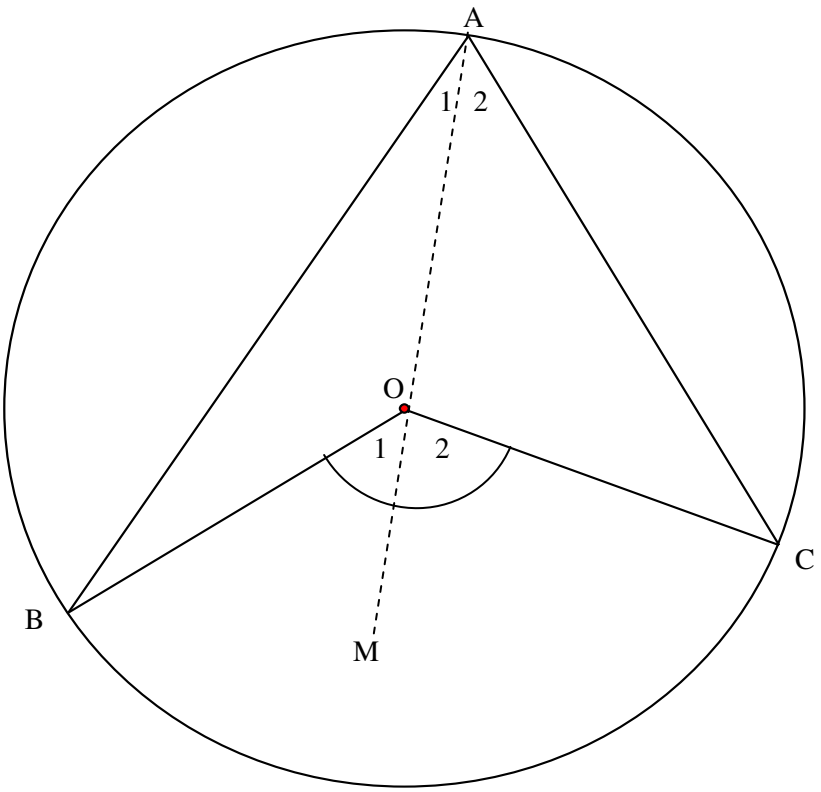
QUESTION/*VRAAG* 9



9.1	equiangular Δs/*gelykhoekige Δe* **OR/*OF*** (∠∠∠)		✓ answer (1)
9.2	$\therefore \frac{GE}{GF} = \frac{DE}{GE}$ $GE^2 = 45 \times 80$ $GE = 60$	[‖‖ Δs]	✓ proportion ✓ substitution ✓ answer (3)
9.3	In ΔDEH and ΔFGH: $D\hat{H}E = F\hat{H}G$ $D\hat{E}H = F\hat{G}H$ $E\hat{D}H = G\hat{F}H$ $\therefore$ ΔDEH ‖‖ ΔFGH **OR/*OF*** In ΔDEH and ΔFGH: $D\hat{H}E = F\hat{H}G$ $D\hat{E}H = F\hat{G}H$ $\therefore$ ΔDEH ‖‖ ΔFGH	 [vert opp ∠s =/*regoorst ∠e* =] [‖‖ Δs] [sum of/*som van* ∠s/*e* in Δ] [vert opp ∠s =/*regoorst ∠e* =] [‖‖ Δs] [∠∠∠]	 ✓ S/R ✓ S/R ✓ S (3) ✓ S/R ✓ S/R ✓ R (3)

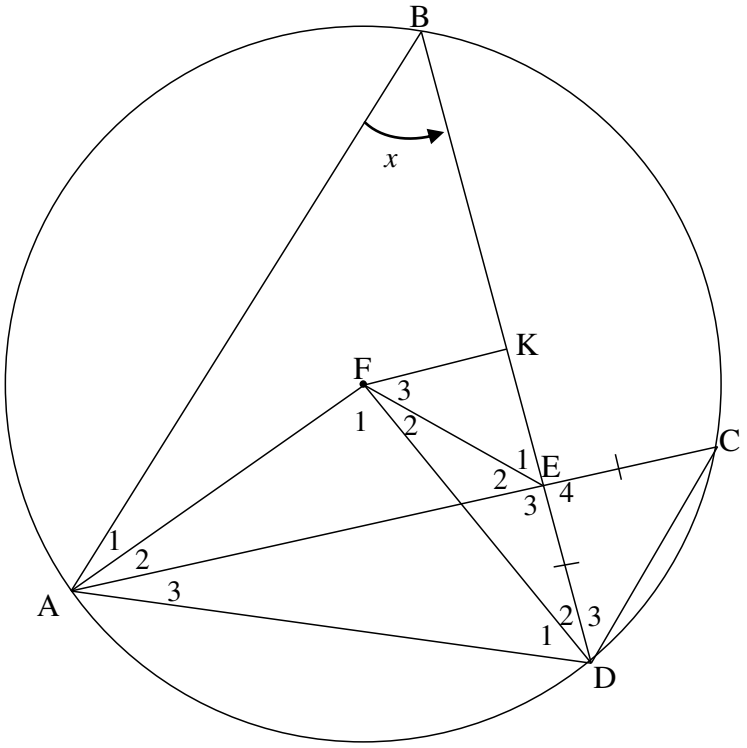
9.4	$\frac{GH}{EH} = \frac{FG}{DE}$ $\frac{GH}{60 - GH} = \frac{80}{45}$ $45\ GH = 80(60 - GH)$ $45\ GH = 4800 - 80\ GH$ $125\ GH = 4800$ $GH = 38{,}4$	[||| Δs] [EH = 60 – GH]	✓S ✓ substitution ✓ answer (3) **[10]**

QUESTION/*VRAAG* 10



10.1	Construction: AO is drawn and produced to M $\hat{O}_1 = \hat{A}_1 + \hat{B}$ [ext $\angle$ of Δ/*buite* $\angle$ *van* Δ] But $\hat{A}_1 = \hat{B}$ [$\angle$s opp = radii/$\angle$*e teenoor* =*radii*] $\therefore \hat{O}_1 = 2\hat{A}_1$ Similarly/*Netso*: $\hat{O}_2 = 2\hat{A}_2$ $\therefore \hat{O}_1 + \hat{O}_2 = 2\hat{A}_1 + 2\hat{A}_2$ $= 2(\hat{A}_1 + \hat{A}_2)$ $B\hat{O}C = 2B\hat{A}C$	✓ Constr ✓ S/R ✓ S/R ✓ S ✓ S (5)

10.2



10.2.1(a)	$\hat{F}_1 = 2x$	[∠ centre = 2∠ at circum/*midpts∠ =2omtreks∠*]	✓ S ✓ R (2)
10.2.1(b)	$\hat{C} = x$	[∠s in the same seg/*∠e in dieselfde segment*]	✓ S ✓ R (2)
	OR/*OF*		
	$\hat{C} = x$	[∠ centre = 2∠ at circum/*midpts∠ =2omtreks∠*]	✓ S ✓ R (2)
10.2.2	$\hat{D}_3 = x$	[∠s opp equal sides/*∠e teenoor = sye*]	✓ S/R
	$\hat{E}_3 = 2x$	[ext ∠ of Δ/*buite ∠ van Δ*]	✓ S/R
	$\therefore \hat{F}_1 = \hat{E}_3 = 2x$		✓ S
	∴ AFED is a cyclic quadrilateral	[converse ∠s in the same seg]/ *Is 'n koordevierhoek* [*omgekeerde ∠e in dieselfde segm*]	✓ R (4)

10.2.3	$\hat{A}_2 + \hat{A}_3 + \hat{D}_1 + \hat{F}_1 = 180°$ [sum of ∠s in Δ/*som van ∠e in Δ*] $\hat{A}_2 + \hat{A}_3 = D_1$ [∠s opp = sides/*∠e teenoor = sye*] $\therefore \hat{A}_2 + \hat{A}_3 = 90° - x$ $\hat{E}_1 = \hat{A}_2 + \hat{A}_3$ [ext∠of cyclic quad/*buite∠ v koordevh*] $= 90° - x$ $F\hat{K}E = 90°$ [line from centre bisects chord]/ [*lyn van midpt halveer koord*] $\hat{F}_3 = x$ [sum of ∠s in Δ/*som van ∠e in Δ*]	✓ S ✓ S ✓ R ✓ S ✓ S ✓ R (6)
10.2.4	$B\hat{A}C = \hat{D}_3$ [∠s in the same seg/*∠e in dieselfde segm*] $AE = BE$ [sides opp equal ∠s/*sye teenoor =∠e*] $\frac{\text{area } \Delta AEB}{\text{area } \Delta DEC} = \frac{\frac{1}{2}(BE)(AE).\sin A\hat{E}B}{\frac{1}{2}(EC)(ED).\sin D\hat{E}C}$ $6,25 = \frac{AE^2}{ED^2}$ $\therefore \frac{AE}{ED} = 2,5$	✓ S ✓ S ✓ substitution into area rule ✓ simplification of RHS ✓ answer (5) **[24]**

TOTAL/*TOTAAL*: 150

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