GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION
VOORBEREIDENDE EKSAMEN



2024

OFFICIAL/ *AMPTELIKE*

MARKING

GUIDELINES/*NASIENRIGLYNE*

MATHEMATICS/*WISKUNDE* (PAPER/*VRAESTEL* 2) (10612)

20 pages/*bladsye*

NOTE:

- **If a candidate answers a question TWICE, only mark the FIRST attempt.**
- **If a candidate has crossed out an attempted 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 to solve a problem is NOT acceptable.**
- **Question 7.3 will be the only question in this marking guideline to have a rounding off penalty.**

LET WEL:

- ***As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.***
- ***As 'n kandidaat 'n antwoord tot 'n vraag doodtrek en nie oordoen nie, sien die doodgetrekte poging na.***
- ***Volgehoue akkuraatheid word in ALLE aspekte van die nasienriglyne toegepas. Hou op nasien by die tweede berekeningsfout.***
- ***Aannames van antwoorde/waardes om 'n probleem op te los, word NIE toegelaat nie.***
- ***Vraag 7.3 is die enigste vraag in die nasienriglyne waar afronding gepenaliseer sal word.***

GEOMETRY/*MEETKUNDE*	
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 die bewering EN rede beide korrek is.

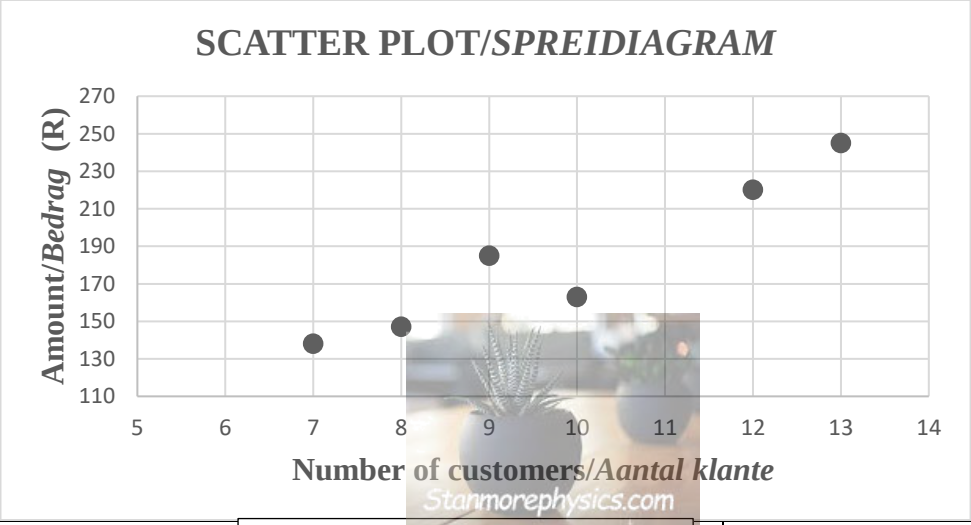
QUESTION/*VRAAG* 1

Monthly salary (in thousand Rand) *Maandelikse salaris (in duisend Rand)*	Number of employees *Aantal werknemers*
R0 $< x \leq$ R10	3
R10 $< x \leq$ R20	4
R20 $< x \leq$ R30	13
R30 $< x \leq$ R40	20
R40 $< x \leq$ R50	21
R50 $< x \leq$ R60	12
R60 $< x \leq$ R70	12
R70 $< x \leq$ R80	8
R80 $< x \leq$ R90	5
R90 $< x \leq$ R100	2

1.1		✓ $(0\ ;\ 0)$ ✓ Upper limit/*Boonste limiet* ✓ Cumulative frequency/ *Kumulatiewe frekwensie* ✓ Shape/*Vorm* (4)
1.2	30 employees/*werknemers*	✓ answer/*antwoord* Accept/*aanvaar* 29-31 (1)
1.3	Median/*Mediaan* = R45 000	✓ answer/*antwoord* Accept/*aanvaar* R44 000 – R46 000 (1)
1.4.1	Mean/*Gemiddeld* = R85 857,14	✓ answer/*antwoord* (1)
1.4.2	Standard deviation/*Standaardafwyking* = R2 294,63	✓ answer/*antwoord* (1)
1.4.3	$(83\ 562{,}51\ ;\ 88\ 151{,}77)$ $\frac{4}{7} \times 100$ $= 57{,}14\%$	✓ interval ✓ 4 ✓ answer/*antwoord* (3)
		[11]

QUESTION/*VRAAG* 2

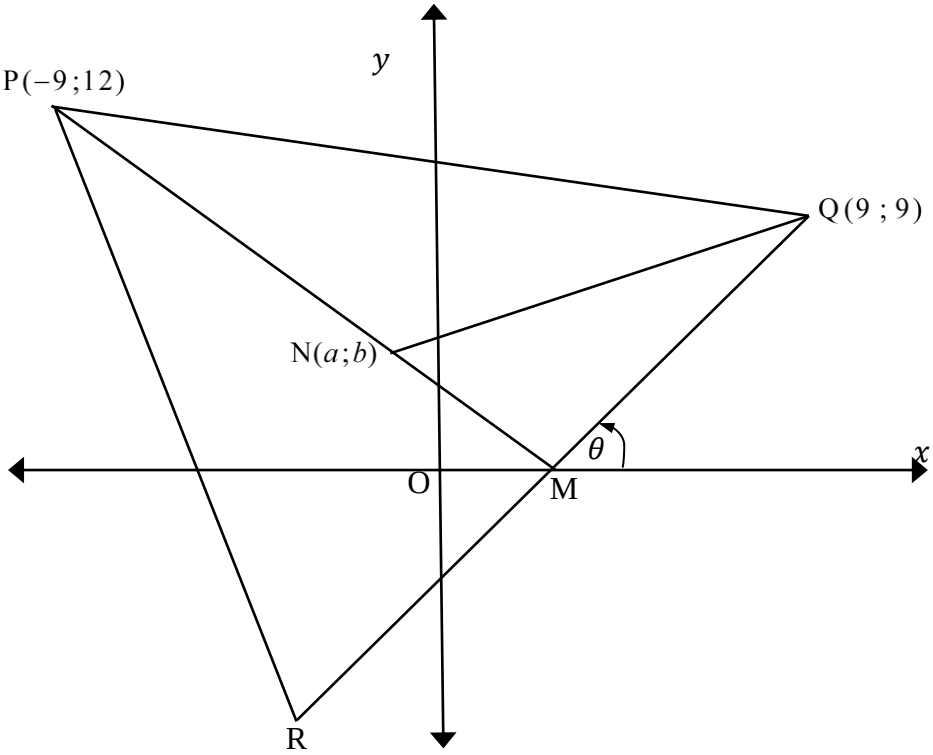
Stall *Stalletjie*	Number of customers/ *Aantal klante*	Amount of money spent (R)/ *Bedrag spandeer* (R)
1	10	163
2	7	138
3	9	185
4	12	220
5	8	147
6	13	245



2.1	$a = 12,59627329$ $b = 17,32919255$ $\hat{y} = 12,60 + 17,33x$	ANSWER ONLY: full marks *SLEGS ANTWOORD: volpunte*	✓ *a* ✓ *b* ✓ equation/*vergelyking* (3)
2.2	$\hat{y} = 12,60 + 17,33(11)$ $\hat{y} = 203,23$ OR/*OF* $\hat{y} = 203,22$ (with calculator/*met sakrekenaar*)	ANSWER ONLY: full marks *SLEGS ANTWOORD: volpunte*	✓ substitution/*substitusie* ✓ R203,23 (2) ✓✓ answer/*antwoord*
2.3	$r = 0,949501084$ $r = 0,95$		✓ value of *r*/*waarde van r* (1)
2.4	No/*Nee* The correlation shows a positive strong correlation between the money spent and the number of customers./*Daar is 'n sterk positiewe korrelasie tussen die geld spandeer en die aantal klante.*		✓ no, strong positive correlation/*nee sterk positiewe korrelasie* NO marks for NO only/ *Geen punte vir slegs NEE* nie (1)

2.5	The gradient will decrease as the line will become less steep. The point is far away from the line. Or the point is above the data./*Die gradiënt sal afneem want die lyn word minder steil. Die punt is ver van die lyn af. Of die punt lê bokant die data.*	✓ decrease/*afneem* ✓ point is above the data/far away from the line/*punt is bokant die lyn/punt is ver weg van die lyn af* (2)
		[9]

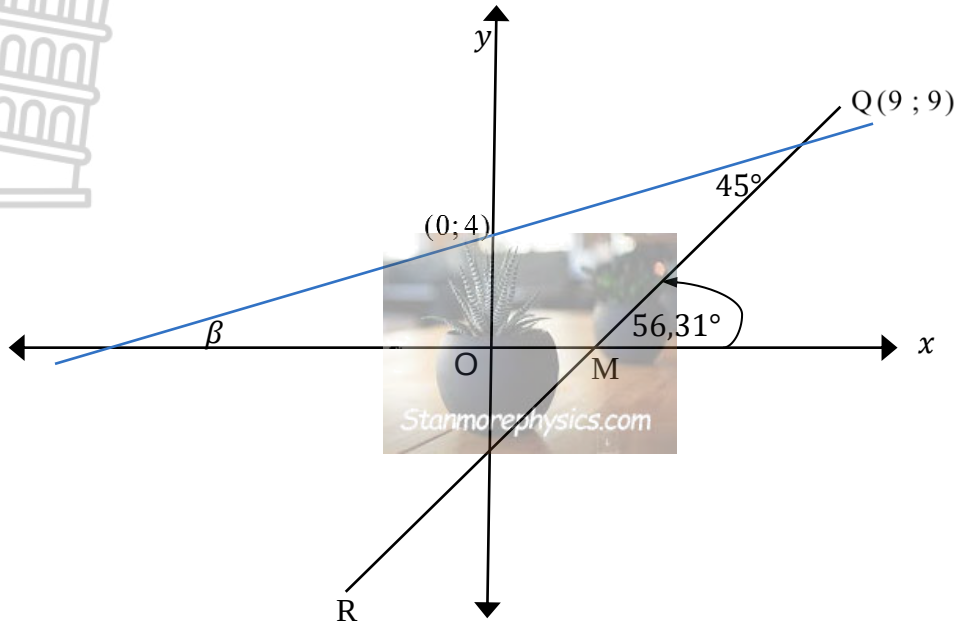
QUESTION/*VRAAG* 3

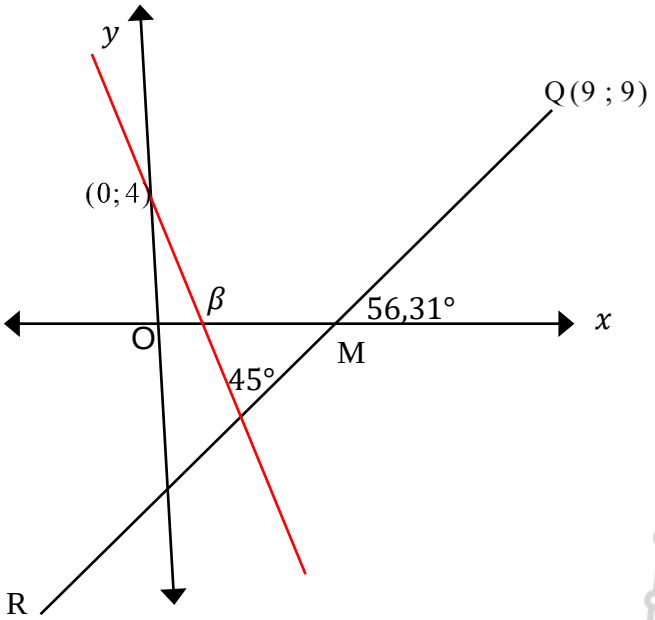


3.1	$2y-3x+9=0$ $2(0)-3x=-9$ $x=3$ $\therefore$ M(3;0)	✓ $y=0$ ✓ $x=3$ (2)
3.2	$m_{PM}=\frac{12-0}{-9-3}$ $=-1$ Substitute/*Vervang* P(–9;12) $y-12=-(x+9)$ $y=-x-9+12$ $y=-x+3$	✓ correct substitution of P and M into gradient formula/*korrekte substitusie van P en M in die gradiënt formule* ✓ $m_{PM}=-1$ ✓ sub of point P or M/ *vervang punt P of M* ✓ equation/*vergelyking* (4)

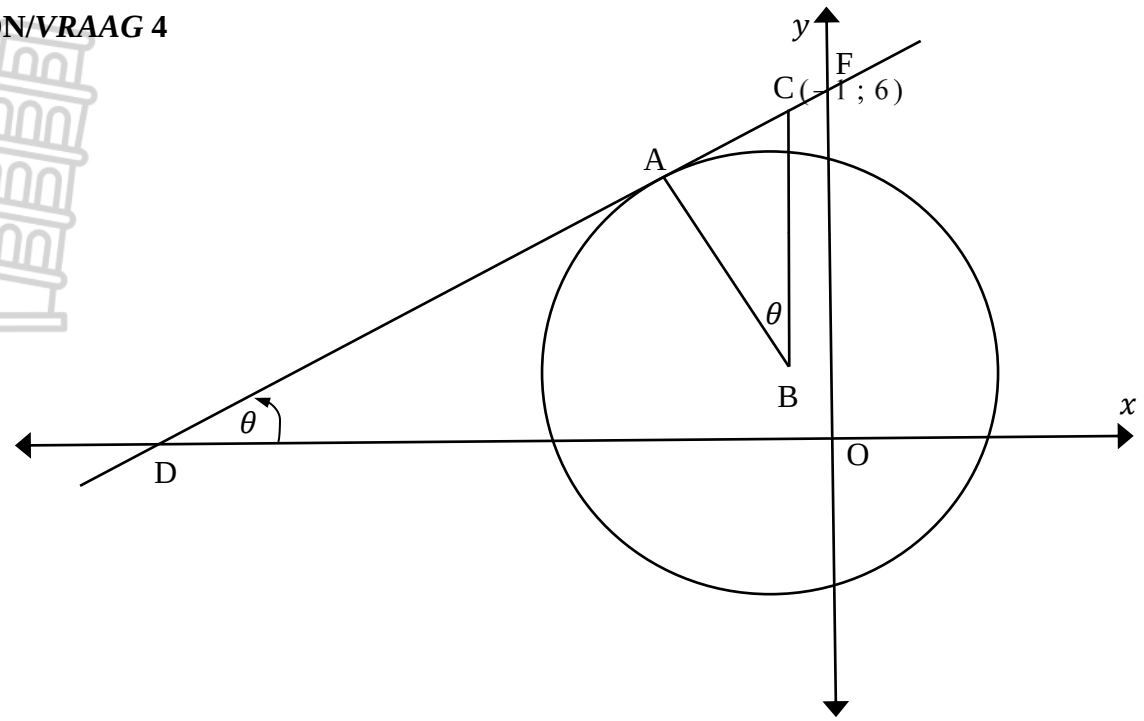
3.3	$\tan\theta = \frac{3}{2}$ $\theta = 56,31°$	✓ $\tan\theta = \frac{3}{2}$ ✓answer/*antwoord* (2)
3.4	Substitute/*vervang* $(a\,;b)$ into/*in* $y = -x+3$: $\therefore b = -a+3$ $\therefore b = 3-a$	✓ substitution/*substitusie* (1)
3.5	$\left(5\sqrt{5}\right)^2 = (a-9)^2 + (b-9)^2$ Substitute/*vervang* $b = 3-a$: $125 = (a-9)^2 + (3-a-9)^2$ $\therefore 125 = a^2 - 18a + 81 + (-a-6)^2$ $\therefore 125 = a^2 - 18a + 81 + a^2 + 12a + 36$ $\therefore 125 = 2a^2 - 6a + 117$ $\therefore 0 = 2a^2 - 6a - 8$ $\therefore 0 = a^2 - 3a - 4$ $\therefore 0 = (a-4)(a+1)$ $\therefore a = 4$ or $a = -1$ Since N is in the second quadrant, we choose $a = -1$. *Omdat N in die tweede kwadrant is, kies* $a = -1$. $\therefore b = 3-(-1)$ $\therefore b = 4$	✓ substitution into correct formula/*substitusie in die korrekte formule* ✓subs of *a*/*vervang a* ✓ standard form/ *standaardvorm* ✓ correct value of *a*/ *korrekte waarde van a* ✓ correct value of *b*/ *korrekte waarde van b* (5)
3.6	$3 = \frac{9+x}{2}$ $0 = \frac{9+y}{2}$ $R(-3\,;-9)$ $(-3)^2 + (-9)^2 = r^2$ $x^2 + y^2 = 90$	✓ $x_R = -3$ ✓ $y_R = -9$ ✓substitution of R/ *vervang R* ✓ $x^2 + y^2 = 90$ (4)
3.7	Let β be the inclination angle of the line/*Laat* β *die inklinasiehoek wees van die lyn* $y = mx+4$ $\beta = 56,31° - 45°$ or/*of* $\beta = 56,31° + 45°$ $\beta = 11,31°$ or/*of* $\beta = 101,31°$ $m = \tan 11,31°$ or/*of* $m = \tan 101.31°$ $m = 0,20$ or/*of* $m = -5,00$	✓ $\beta = 11,31°$ ✓ $\beta = 101,31°$ ✓ $m = 0,20$ ✓ $m = -5,0$ (4)
	See diagram for Q3.7 on the next page./ *Sien die diagram vir V3.7 op die volgende bladsy.*	
		[22]

3.7

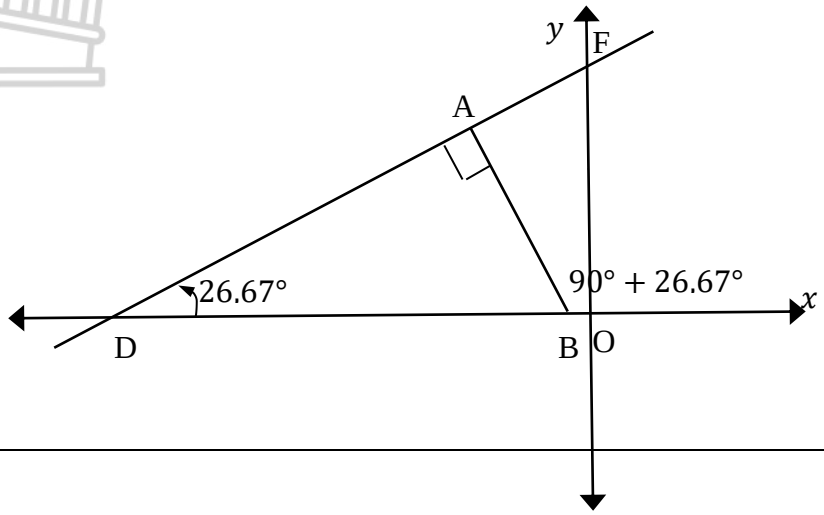




QUESTION/*VRAAG* 4



4.1	$B(-1;1)$	✓answer/*antwoord* (1)
4.2	BC = 6 − 1= 5 AB = $\sqrt{20}$ CÂB = 90° tan ⊥ rad/*rklyn* ⊥ *rad* AC^2 = $(5)^2 - \left(\sqrt{20}\right)^2$ AC = $\sqrt{5}$	✓BC = 5 ✓CÂB = 90° ✓ subs in Pythagoras/ v*ervang in Pythagoras* (3)
4.3	$\tan\theta = \frac{AC}{AB} = \frac{\sqrt{5}}{\sqrt{20}} = \frac{1}{2}$	✓ $\tan\theta = \frac{1}{2}$ (1)
4.4	$m_{DC} \times m_{AB} = -1$ $m_{DC} = \tan\theta = \frac{1}{2}$ $m_{AB} = -2$ Substitute/*Vervang* B(−1;1) $y - 1 = -2(x+1)$ $y = -2x - 1$ OR/*OF*	✓ $m_{DC} = \frac{1}{2}$ ✓ $m_{AB} = -2$ ✓substitution of m and B/ *substitusie van m en B* (3)

	$m_{AB} = \tan(90 + 26{,}57°)$ $m_{AB} = -2$ Substitute/ Vervang $B(-1\,;1)$ $y - 1 = -2(x + 1)$ $y = -2x - 1$  	✓ $m_{AB} = \tan(90 + 26{,}57°)$ ✓ $m_{AB} = -2$ ✓substitution of m and B/ *substitusie van m en B* (3)
4.5	$(x + 1)^2 + (-2x - 1 - 1)^2 = 20$ $x^2 + 2x + 1 + 4x^2 + 8x + 4 = 20$ $5x^2 + 10x - 15 = 0$ $x^2 + 2x - 3 = 0$ $(x + 3)(x - 1) = 0$ $x = -3$ or/of $x = 1$ $y = -2(-3) - 1$ $y = 5$ $A(-3\,;5)$ OR/*OF*	✓substitution into correct formula/*substitusie in die korrekte formule* ✓standard form/ *standaardvorm* ✓ $x = -3$ ✓ $y = 5$ (4)

	Eq of DC/*Verg van DC*: $y-6=\frac{1}{2}(x+1)$ $y=\frac{1}{2}x+6,5$ $\frac{1}{2}x+6,5=-2x-1$ $x+13=-4x-2$ $5x=-15$ $x=-3$ $y=-2(-3)-1$ $y=5$ $\therefore$ A$(-3;5)$	✓equation of DC/ *vergelyking van DC* ✓equate/*gelykstel* ✓ $x=-3$ ✓ $y=5$ (4)
4.6	Area of/*van* ΔABC $=\frac{1}{2}\left(\sqrt{20}\right)\left(\sqrt{5}\right)\sin 26,57°$ $=5$ Area of/*van* ΔODF $=\frac{1}{2}(13)(14,53)\sin 26,57°$ $=42,25$ Area of/*van* ΔABC : Area of ΔODF $=20:169$ OR/*OF* Area Δ ABC $=\frac{1}{2}\times\sqrt{5}\times\sqrt{20}=5$ Equation of DC/*Vergelyking van DC*: $y-6=\frac{1}{2}(x+1)$ $y=\frac{1}{2}x+6,5$ Equation of/*verg van* DC is $y=\frac{1}{2}x+\frac{13}{2}$ OF $=\frac{13}{2}$ and/*en* OD $=13$ Area of Δ ODF $=\frac{1}{2}\times\left(\frac{13}{2}\right)\times 13=\frac{169}{4}$ Area Δ ABC : Area Δ ODF $=20:169$	✓$\frac{1}{2}\left(\sqrt{20}\right)\left(\sqrt{5}\right)\sin 26,57°$ ✓ area of / *van* ΔABC $=5$ ✓ 13 and/*en* 14,53 ✓ sin 26,57° ✓ area of / *van* ΔODF $=42,25$ ✓answer/*antwoord* (6) ✓$\frac{1}{2}\times\sqrt{5}\times\sqrt{20}$ ✓$y=\frac{1}{2}x+\frac{13}{2}$ ✓OF $=\frac{13}{2}$ ✓OD $=13$ ✓$\frac{1}{2}\times\frac{13}{2}\times 13$ ✓answer/*antwoord* (6)
		[18]

QUESTION/*VRAAG* 5

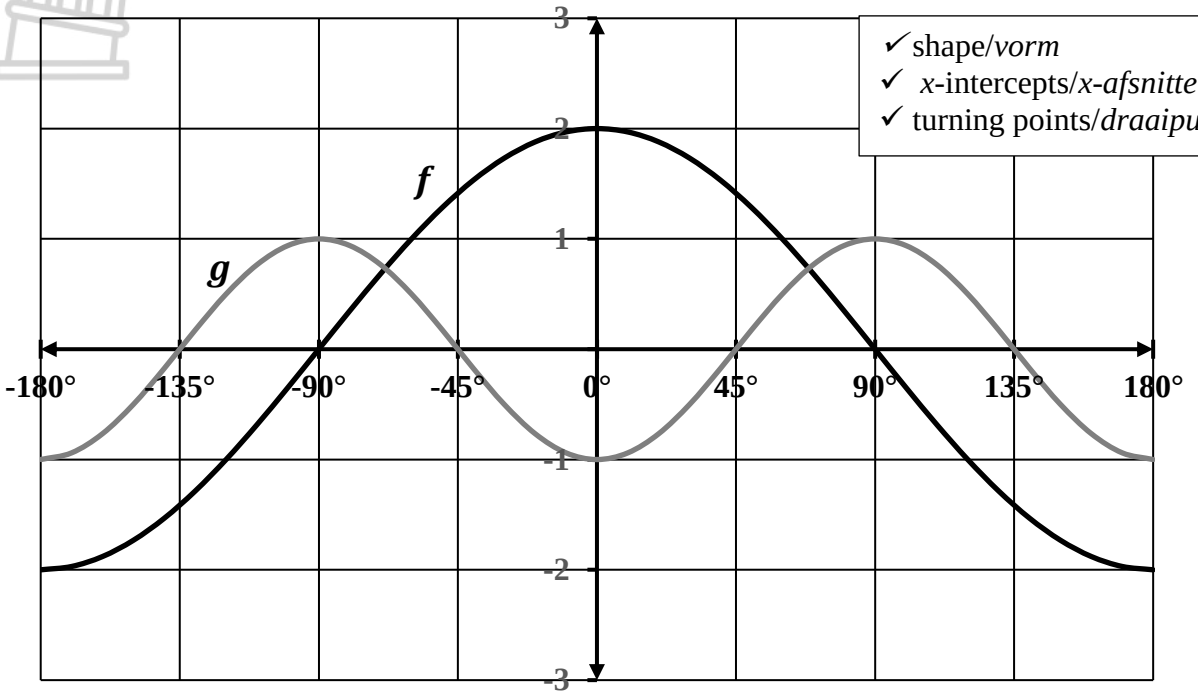
5.1	$\frac{\sin^2(180°+x).\sin(-x)}{-\sin(90°+x).\tan x} - 1$ $= \frac{(-\sin x)^2.-\sin x}{-\cos x.\frac{\sin x}{\cos x}} - 1$ $= \sin^2 x - 1$ $= -1(1-\sin^2 x)$ $= -\cos^2 x$	✓ $(-\sin x)^2$ ✓ $-\sin x$ ✓ $-\cos x$ ✓ $\frac{\sin x}{\cos x}$ ✓ $\sin^2 x - 1$ ✓ $-\cos^2 x$ (6)
5.2.1	$\sin(A+B)$ $= \cos[90° - (A+B)]$ $= \cos[(90° - A) - B]$ $= \cos(90° - A)\cos B + \sin(90° - A)\sin B$ $= \sin A\cos B + \cos A\sin B$	✓ $\cos[90° - (A+B)]$ ✓ $\cos[(90° - A) - B]$ ✓ expansion/*uitbreiding* (3)
5.2.2	$\cos 420°\cos 15° + \sin 300°\cos 105°$ $= \cos 60°\cos 15° + (-\sin 60°)(-\sin 15°)$ $= \cos(60° - 15°)$ $= \cos 45°$ $= \frac{\sqrt{2}}{2}$	✓ $\cos 60°$ ✓ $-\sin 60°$ ✓ $-\sin 15°$ ✓ $\cos(60° - 15°)$ ✓ $\frac{\sqrt{2}}{2}$ (5)
5.3.1	LHS/*LK* $= \tan^2 x\left(\frac{1}{\tan^2 x} - 1\right)$ $= 1 - \tan^2 x$ $= 1 - \frac{\sin^2 x}{\cos^2 x}$ $= \frac{\cos^2 x - \sin^2}{\cos^2 x}$ $= \frac{\cos 2x}{\cos^2 x}$ = RHS/*RK*	✓ $1 - \tan^2 x$ ✓ $\frac{\sin^2 x}{\cos^2 x}$ ✓ $\frac{\cos^2 x - \sin^2}{\cos^2 x}$ (3)
5.3.2	$x = 90°$	✓ answer/*antwoord* (1)

Stanmorephysics.com

5.4	$\cos 2x = \cos x$ $2\cos^2 x - 1 = \cos x$ $2\cos^2 x - \cos x - 1 = 0$ $(2\cos x + 1)(\cos x - 1) = 0$ $\cos x = -\frac{1}{2}$ *or / of* $\cos x = 1$ $x = 180° - 60° + k360°;\ k \in Z$ or $x = k360°;\ k \in Z$ $x = 120° + k360°;\ k \in Z$ or/of $x = 180° + 60° + k360°;\ k \in Z$ $x = 240° + k360°;\ k \in Z$	✓ $\cos 2x = 2\cos^2 x - 1$ ✓ standard form *standaardvorm* ✓ both answers for $\cos x$ *albei antwoorde vir* $\cos x$ ✓ $x = k360°;\ k \in Z$ ✓ $x = 120°$ and / *en* $x = 240°$ ✓ $x = +k360°;\ k \in Z$ (6)
5.5	$\sin 3\theta = \sin(2\theta + \theta)$ $= \sin 2\theta\cos\theta + \cos 2\theta\sin\theta$ $= (2\sin\theta\cos\theta)\cos\theta + (1 - 2\sin^2\theta)\sin\theta$ $= 2\sin\theta\cos^2\theta + \sin\theta - 2\sin^3\theta$ $= 2\sin\theta(1 - \sin^2\theta) + \sin\theta - 2\sin^3\theta$ $= 2\sin\theta - 2\sin^3\theta + \sin\theta - 2\sin^3\theta$ $= 3\sin\theta - 4\sin^3\theta$ $= 3\left(\frac{1}{2}\right) - 4\left(\frac{1}{2}\right)^3$ $= 1$ OR/*OF* $\sin\theta = \frac{1}{2}$ $\theta = 30°$ *or* $\theta = 150°$ $\sin 3\theta$ $\sin 3\theta$ $= \sin 3(30°)$ $= \sin 3(150°)$ $= \sin 90°$ $= \sin 450°$ $= 1$ $= \sin 90°$ $= 1$	✓ $\sin 3\theta = \sin(2\theta + \theta)$ ✓ compound expansion/ *saamgestelde uitbreiding* ✓ $\sin 2\theta = 2\sin\theta\cos\theta$ ✓ $\cos 2\theta = 1 - 2\sin^2\theta$ ✓ $\cos^2\theta = 1 - \sin^2\theta$ ✓ sub/*vervang* $\sin\theta = \frac{1}{2}$ ✓ answer/*antwoord* (7) ✓ $\theta = 30°$ ✓ $\theta = 150°$ ✓ $\sin 3(30°)$ ✓ $\sin 3(150°)$ ✓ $\sin 450°$ ✓ $\sin 450° = \sin 90°$ ✓ $\sin 90° = 1$ (7)
		[31]

QUESTION/*VRAAG* 6

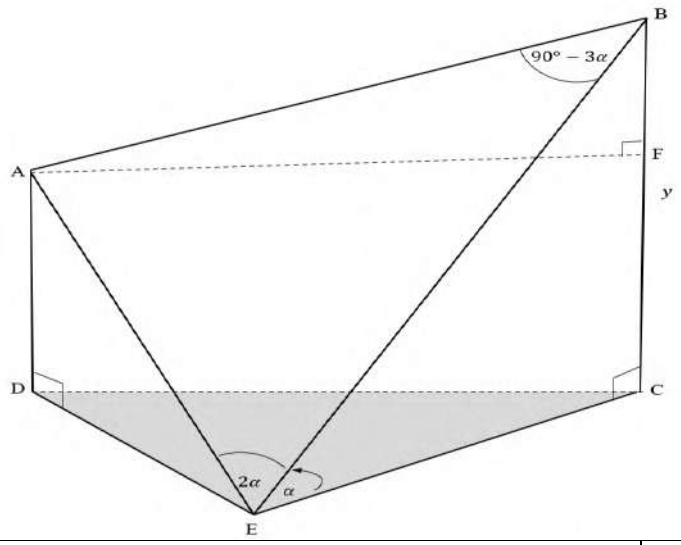
6.1



(3)

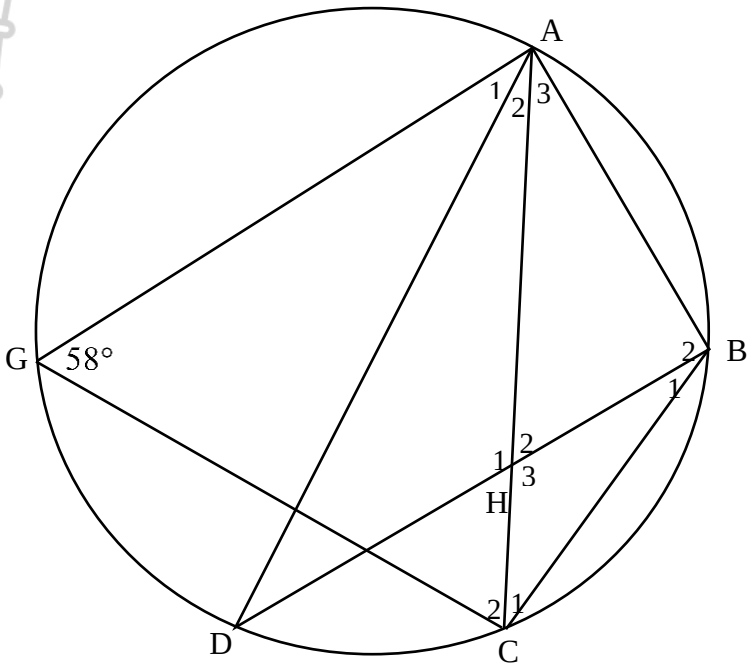
6.2	$180°$	✓ $180°$ (1)
6.3	$x \in [0° ; 45°]$ $x \in [90° ; 135°]$	✓ $x \in [0° ; 45°]$ ✓ $x \in [90° ; 135°]$ (2)
6.4	Maximum value of/*Maksimum waarde van* $f(x)-g(x)=2-(-1)=3$	✓ 3 (1)
6.5	$y = 2^{2cosx+2}$ Range of / *Waardevers van* $2\cos x$: $-2 \le y \le 2$ Range of / *Waardevers van* $2\cos x+2$: $0 \le y \le 4$ Range of / *Waardevers van* $2^{2\cos x+2}$ $2^0 \le y \le 2^4$ $\therefore 1 \le y \le 16$	✓✓ $1 \le y \le 16$ (2)
		[9]

QUESTION/*VRAAG* 7

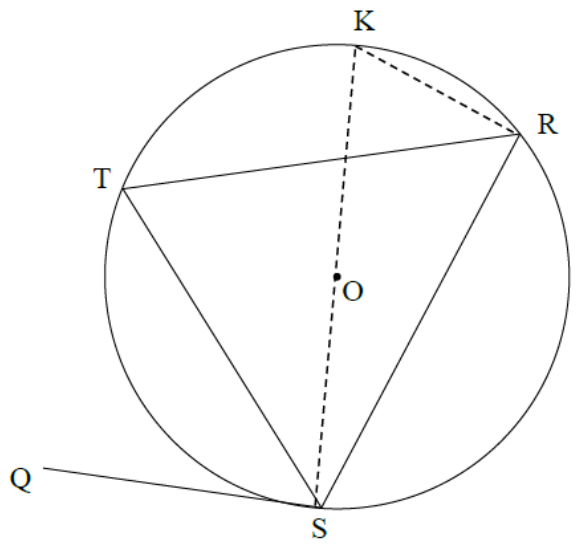


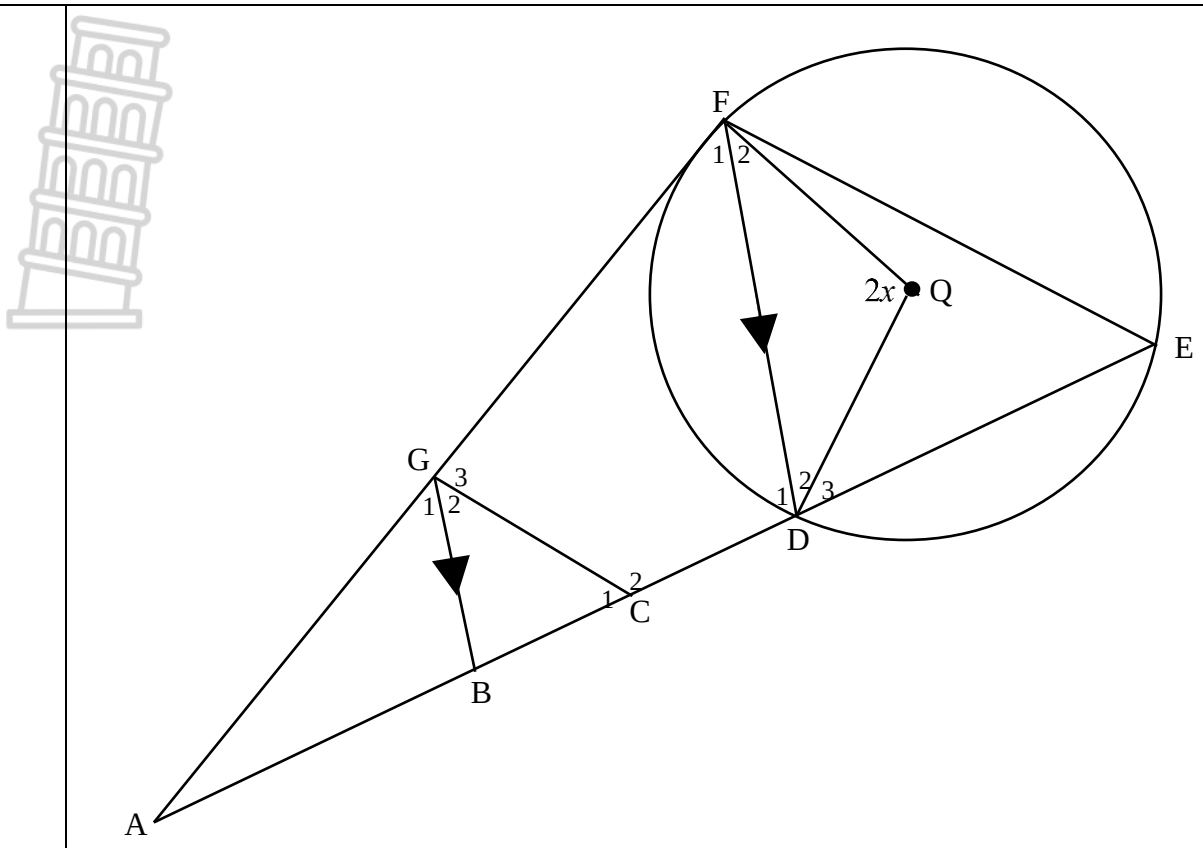
7.1	$\sin\alpha = \frac{y}{BE}$ $BE = \frac{y}{\sin\alpha}$	✓correct ratio/ *korrekte verhouding* ✓ $BE = \frac{y}{\sin\alpha}$ (2)
7.2	In Δ ABE : $B\hat{A}E = 90° + \alpha.$ $\frac{AB}{\sin 2\alpha} = \frac{BE}{\sin(90° + \alpha)}$ $AB = \frac{BE \times \sin 2\alpha}{\cos\alpha}$ $= \frac{\frac{y}{\sin\alpha} \times 2\sin\alpha\cos\alpha}{\cos\alpha}$ $= 2y$	✓ $B\hat{A}E = 90° + \alpha$ ✓ correct use of sine rule/ *korrekte gebruik van sin reël* ✓ double angle/*dubbelhoek* ✓co-function/*ko-funksie* ✓ substitution of BE/ *vervang BE* (5)
7.3	In Δ BAF is: $\cos B\hat{A}F = \frac{AF}{AB} = \frac{\frac{7y}{4}}{2y}$ $= \frac{7}{8}$ $B\hat{A}F = 28,955..°$ $= 29°$	✓correct ratio in terms of *y/korrekte verhouding in terme van y* ✓ $\cos B\hat{A}F = \frac{7}{8}$ ✓29° / PENALTY for incorrect rounding off/ Penaliseer vir foutiewe afronding (3)
		[10]

QUESTION/*VRAAG* 8

8.			
8.1.1	$\hat{B}_2 = 90°$	∠ in semi-circle/*∠ in 'n halwe sirkel*	✓S ✓R (2)
8.1.2	$\hat{B}_1 + \hat{B}_2 + \hat{G} = 180°$ $\hat{B}_1 = 32°$	opposite ∠s of cyclic quad/*teenoorst ∠e van kvh*	✓R ✓S (2)
8.1.3	$\hat{A}_2 = \hat{B}_1 = 32°$	∠s in the same segment/ *∠e in dieselfde segment*	✓S ✓R (2)
8.2	$\hat{C}_1 = \hat{A}_3 = 29°$ $\hat{D} = \hat{C}_1 = 29°$ $\therefore \hat{A}_3 = \hat{D} = 29°$ ∴AB is a tangent to the circle/*AB is 'n raaklyn aan die sirkel*	∠s opposite equal sides/*∠e teenoor gelyke sye* ∠s in the same segment/*∠e in dieselfde segment* converse tan chord theorem/ *omgekeerde raaklyn koordstelling*	✓S/R ✓S/R ✓R (3)
			[9]

QUESTION/*VRAAG* 9

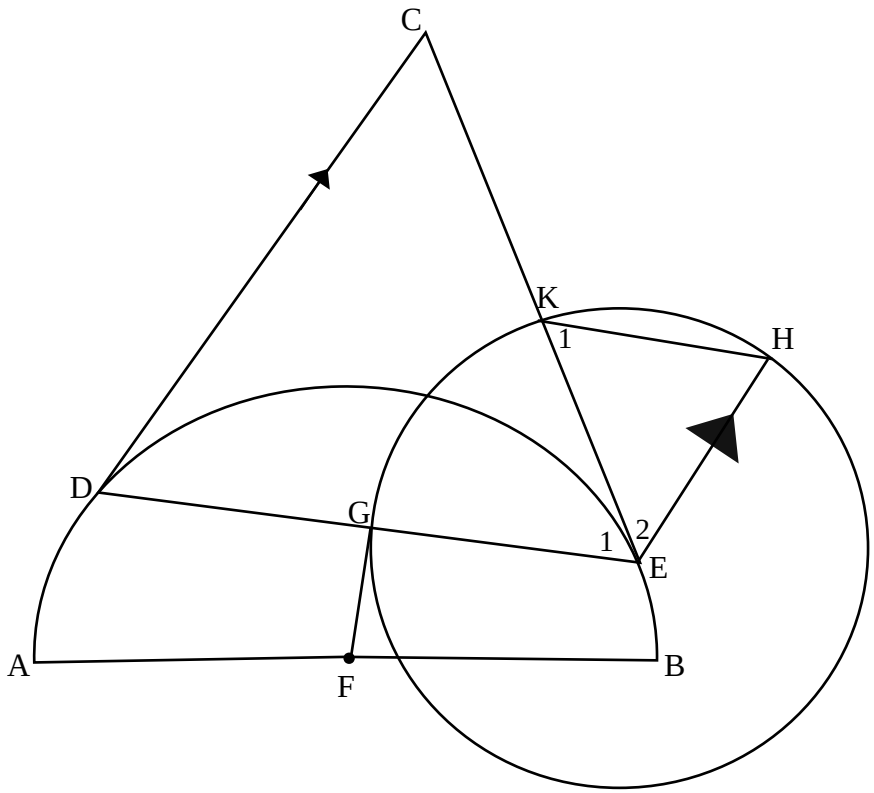
9.1		
	Construction/*Konstruksie*: Draw diameter KS and join KR/*Trek middellyn KS en trek KR* $Q\hat{S}K = 90°$ radius ⊥ tangent/*raaklyn* $S\hat{R}K = 90°$ ∠ in semicircle/*halwe sirkel* but/*maar* $T\hat{S}K = T\hat{R}K$ ∠'s in the same segment/ *∠e in dieselfde segment* $\therefore Q\hat{S}T = \hat{R}$	✓construction/ *konstruksie* ✓S ✓R ✓S/R ✓S ✓R (6)

9.2			
9.2.1	$\hat{E} = x$	$\angle$ centre = 2$\times$ $\angle$ at circumference/ *midpts∠=2 x omtreks∠*	✓R (1)
9.2.2	$\hat{F}_1 = \hat{E} = x$ $\hat{C}_1 = \hat{F}_1 = x$ $\therefore \hat{C}_1 = \hat{E}$ $\therefore$ GC|| FE	tan chord theorem/ *rklyn koordstelling* ext. ∠ of cyclic quad/ *buite* ∠ van kvh corresponding ∠s are equal/ *ooreenk ∠e is gelyk*	✓S/R ✓S/R ✓R (3)
9.2.3	$\frac{AB}{BD} = \frac{AG}{GF}$ $\frac{AG}{GF} = \frac{AC}{CE}$ $\therefore \frac{AB}{BD} = \frac{AC}{CE}$	prop. theorem/*eweredigheid-stelling*; GB || FD prop. theorem/*eweredigheid-stelling*; GC || FE	✓S ✓R ✓S (3)

9.2.4	$\frac{AB}{BD}=\frac{4}{5}$ and/*en* $\frac{AC}{CE}=\frac{4}{5}$ $\frac{12}{BD}=\frac{4}{5}$ and/*en* $\frac{AC}{22,5}=\frac{4}{5}$ $BD=15$ and/*en* $AC=18$ $BC = AC - AB$ $= 18 - 12$ $= 6$ $CD = BD - BC$ $= 15 - 6$ $= 9$	✓substitution/ *substitusie* ✓BD =15 ✓AC =18 ✓BC = 6 ✓CD = 9 (5)
		[18]

QUESTION/*VRAAG* 10

10.



10.1	Tangents from the same point	✓R (1)
10.2	In Δ DCE and Δ HEK is :	
	1. $\hat{C} = \hat{E}_2$ alt. ∠s./*verw.* ∠e ,DC || EH	✓S /R
	2. $\hat{D} = \hat{E}_1$ ∠s opp equal sides/*∠e teenoor gelyke sye*	✓S
	$2\hat{D} = 180° - \hat{C}$ sum of ∠s in triangle/ *binne ∠e van Δ*	✓S
	$\hat{K}_1 = \hat{H}$ ∠s opp radii/ */∠e teenoor gelyke radii*	✓S/R
	$2\hat{H} = 180° - \hat{E}_2$ sum of ∠s in triangle / *binne ∠e van Δ*	✓S
	but $\hat{C} = \hat{E}_2$ proved	
	$\therefore \hat{D} = \hat{H}$	
	$\therefore \Delta CDE \|\|\| \Delta EHK$ ∠∠∠	✓R (6)

10.3	$\hat{FGE} = 90°$ $\therefore DG = GE$	tan ⊥radius / *rkln⊥radius* line from centre ⊥ to chord/ *lyn vanuit midpt loodreg op koord*	✓S ✓R ✓R (3)
10.4	$\frac{DC}{HE} = \frac{DE}{HK}$ $DC \times HK = DE \times HE$ $DC \times HK = 2GE \times HE$ but $GE = HE$ $\therefore DC \times HK = 2HE^2$	$\Delta CDE \|\|\| \Delta EHK$ radii/*radiusse*	✓S/R ✓substitute DE=2GE ✓S (3)
			[13]

TOTAL/*TOTAAL:* 150