GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINSIALE EKSAMEN

NOVEMBER 2022

GRAAD 10

WISKUNDE

(VRAESTEL 2)

TYD: **1 uur**

PUNTE: **100**

9 bladsye + 1 inligtingsblad en 'n spesiale antwoordboek van 14 bladsye

INSTRUKSIES EN INLIGTING

Lees die volgende instruksies aandagtig deur voordat jy die vrae beantwoord.

1. Hierdie vraestel bestaan uit 10 vrae.

2. Beantwoord AL die vrae in die ANTWOORDBOEK wat voorsien is.

3. Dui ALLE berekeninge, diagramme, grafieke, ensovoorts wat jy in die beantwoording van die vrae gebruik, duidelik aan.

4. Slegs antwoorde sal NIE noodwendig volpunte verdien NIE.

5. Jy mag ʼn goedgekeurde wetenskaplike sakrekenaar (nie-programmeerbaar en nie-grafies) gebruik, tensy anders aangedui.

6. Indien nodig, rond antwoorde tot TWEE desimale plekke af, tensy anders aangedui.

7. Diagramme is NIE noodwendig volgens skaal geteken NIE.

8. Skryf netjies en leesbaar.

VRAAG 1

Die lengtes van 18 graad 8-leerders is in cm aangeteken soos hieronder getoon. Gebruik die data hieronder om die vrae wat volg te beantwoord.

147	131	142	133	152	125
128	162	129	165	151	130
143	162	110	129	139	153

1.1 Stel die data op ŉ stingel- en blaardiagram voor. (4)

1.2 Bepaal die:

1.2.1 Mediaan (2)

1.2.2 Modus (1)

1.2.3 Onderste kwartiel en die boonste kwartiel (2)

1.2.4 Gemiddeld (2)
[11]

VRAAG 2

Die syfers in die tabel hieronder is die ouderdomme, tot die naaste jaar, van ŉ ewekansige steekproef van 30 mense wat in ŉ bank onderhandel vir ŉ verband. Gebruik die data hieronder om die vrae wat volg te beantwoord.

29	**26**	**31**	**42**	**38**	**45**	**35**	**37**	**38**	**38**
36	**39**	**49**	**40**	**32**	**32**	**34**	**27**	**56**	**29**
33	**31**	**33**	**52**	**44**	**32**	**30**	**38**	**42**	**33**

2.1 Voltooi die frekwensietabel op die diagram wat in jou ANTWOORDBOEK voorsien word. (4)

FREKWENSIE TABEL

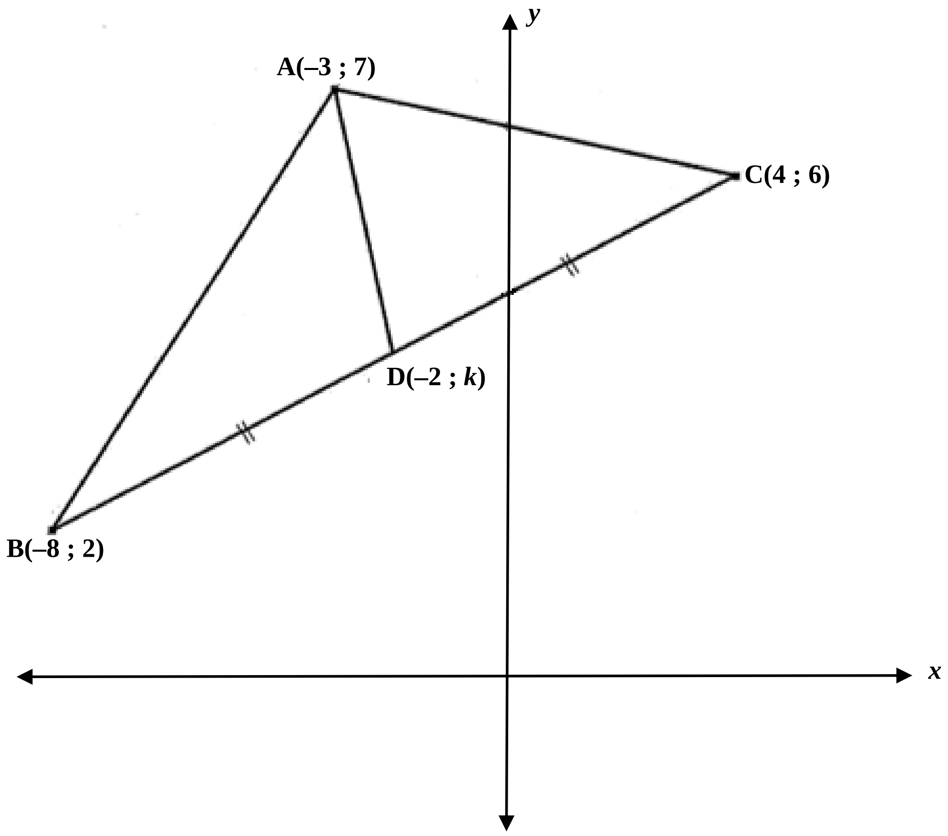
OUDERDOMSINTERVALLE	TELLING	FREKWENSIE
$25 \leq x < 33$		
$33 \leq x < 41$		
$41 \leq x < 49$		
$49 \leq x < 57$		

2.2 Gebruik die inligting uit die frekwensietabel om ŉ histogram op die rooster wat in die SPESIALE ANTWOORDBLAD verskaf word, te teken. (2)

2.3 Teken ŉ frekwensieveelhoek op die rooster wat in die SPESIALE ANTWOORDBLAD voorsien word. (3)
[9]

VRAAG 3

In die diagram hieronder is A (–3;7), B (–8;2) en C (4;6) die hoekpunte van driehoek ABC.
AD is so geteken dat D (–2;*k*) die middelpunt van BC is.



3.1 Bepaal die gradiënt (helling) van BC. (2)

3.2 Bereken die lengte van BC. (2)

3.3 Bepaal die waarde van k. (2)

3.4 Is AD ⊥ BC? Wys al jou berekeninge. (3)
[9]

VRAAG 4

4.1 As x = 66,4° en y = 114,7°, evalueer die volgende korrek tot TWEE desimale plekke.

4.1.1 $\cos(x + y)$ (2)

4.1.2 $2\sin x$ (2)

4.1.3 $\text{cosec } x$ (2)

4.2 Bepaal die waarde van θ korrek tot EEN desimale plek.

4.2.1 $\sin\theta + 0,38 = 1$ (2)

4.2.2 $2\cot 2\theta = 3$ $2\cos(3\theta - 60°) = 1,71$ (3)

4.2.3 $2\cos(3\theta - 60°) = 1,71$ (4)

[15]

VRAAG 5

5.1 Gegee dat $\sin\theta = \frac{4}{5}$ en $\tan\theta < 0$. Bepaal met behulp van ŉ diagram en SONDER die gebruik van ŉ sakrekenaar:

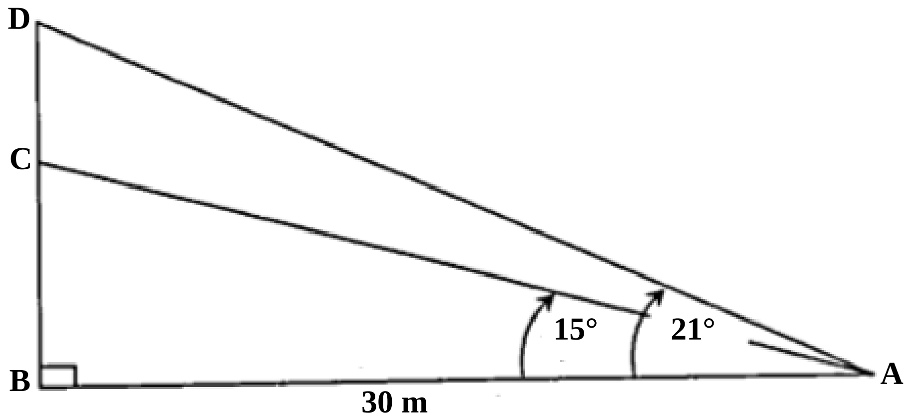
5.1.1 $\tan\theta$ (4)

5.1.2 $2\cos^2\theta - 1$ (2)

5.2 Vereenvoudig die volgende uitdrukking SONDER om ŉ sakrekenaar te gebruik.

$\cos 0° + \sin^2 60° + \sqrt{2} \cdot \sec 45°$ (4)

5.3 In die diagram hieronder staan ŉ persoon by punt A wat 30 m van punt B af is. Punt A en punt B is in dieselfde horisontale vlak. Die hoogtehoek van ŉ venster op die eerste verdieping by punt C vanaf punt A is 15°. Die hoogtehoek van ŉ venster op die tweede verdieping by punt D vanaf punt A is 21°.

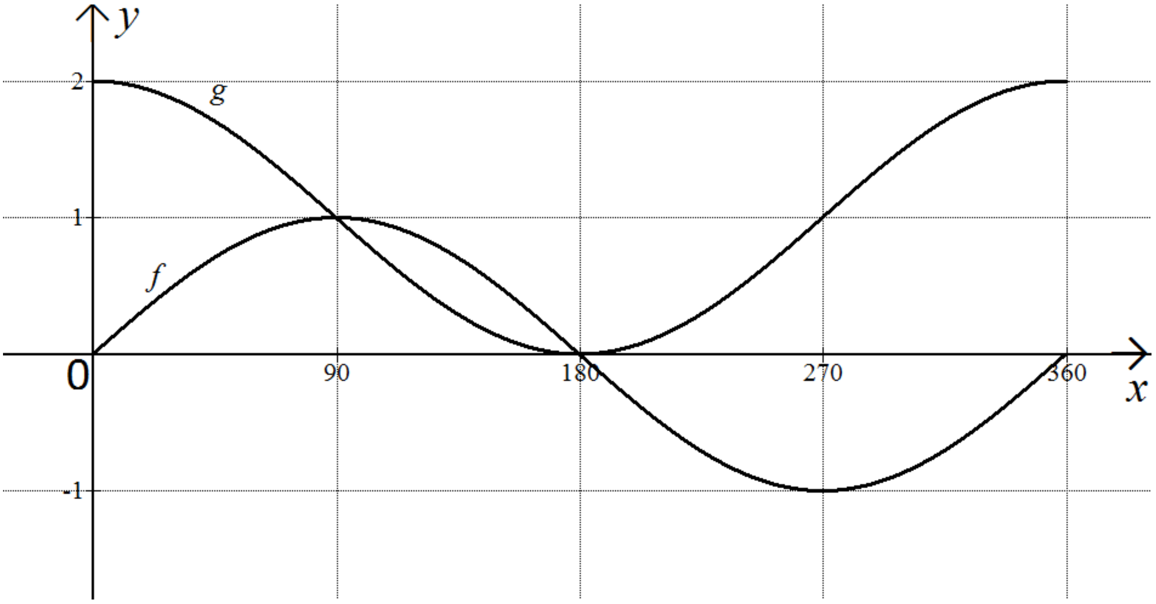


Bepaal die afstand tussen die twee vensters. (6)

[16]

VRAAG 6

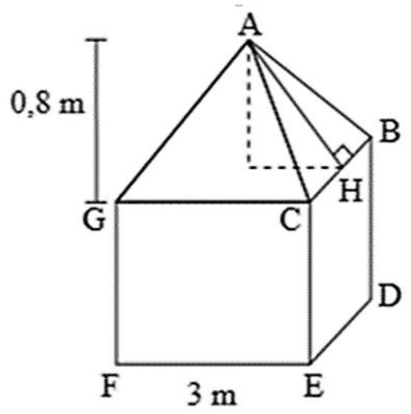
Die grafieke van $f(x) = a \sin x$ en $g(x) \cos x + 1$ vir $x \in [0°; 360°]$.



6.1	Skryf die waarde van a neer.	(1)
6.2	Bepaal die waardeversameling van g.	(2)
6.3	Bepaal die amplitude van g.	(1)
6.4	Vir watter waarde(s) van x sal $f(x) \geq g(x)$.	(2)
6.5	Vir watter waarde(s) van x sal $g(x) - f(x) = 2$.	(3)
6.6	Die grafiek van f word oor die x-as gereflekteer. Skryf die vergelyking van die nuwe grafiek h neer.	(1)
		[10]

VRAAG 7

7.1 Die dak van ŉ seiltent is in die vorm van ŉ regte piramide met ŉ loodregte hoogte van 0,8 meter op ŉ vierkantige basis. Die lengte van die een kant van die basis is 3 meter.



7.1.1 Bereken die lengte van AH. (2)

7.1.2 Bereken die buite-oppervlakte van die dak. (2)

7.1.3 As die hoogte van die mure van die tent 2,1 meter is, bereken die totale hoeveelheid seil wat benodig word om die tent te maak as die vloer uitgesluit is. (2)

7.2 ŉ Metaalbal het ŉ radius van 8 millimeter.

Volume van die sfeer = $\frac{4}{3}\pi r^3$

7.2. 1 Bereken die volume metaal wat gebruik word om hierdie bal te maak. Gee jou antwoord korrek tot TWEE desimale plekke. (2)

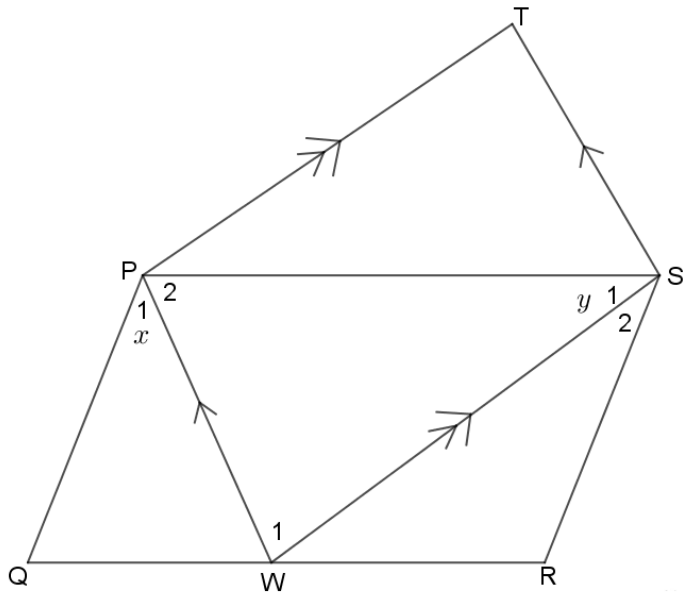
7.2.2 As die radius van die bal verdubbel word, skryf die verhouding van die nuwe volume : die oorspronklike volume neer. (2)

7.2.3 Jy wil graag hê dat hierdie bal met ŉ dikte van 1 millimeter silwer bedek moet wees. Wat is die volume silwer wat benodig word? Gee jou antwoord korrek tot TWEE desimale plekke. (2)

[12]

VRAAG 8

In parallelogram PQRS halveer PW vir $Q\hat{P}S$ en SW halveer $P\hat{S}R$. PW // ST en PT // WS.

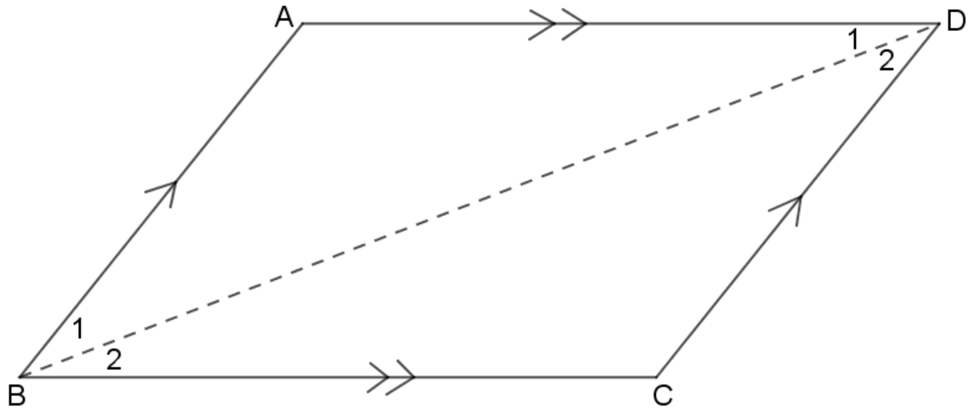


8.1 Bewys dat x + y = 90°. (4)

8.2 Bewys dat PWST ŉ reghoek is. (4)
[8]

VRAAG 9

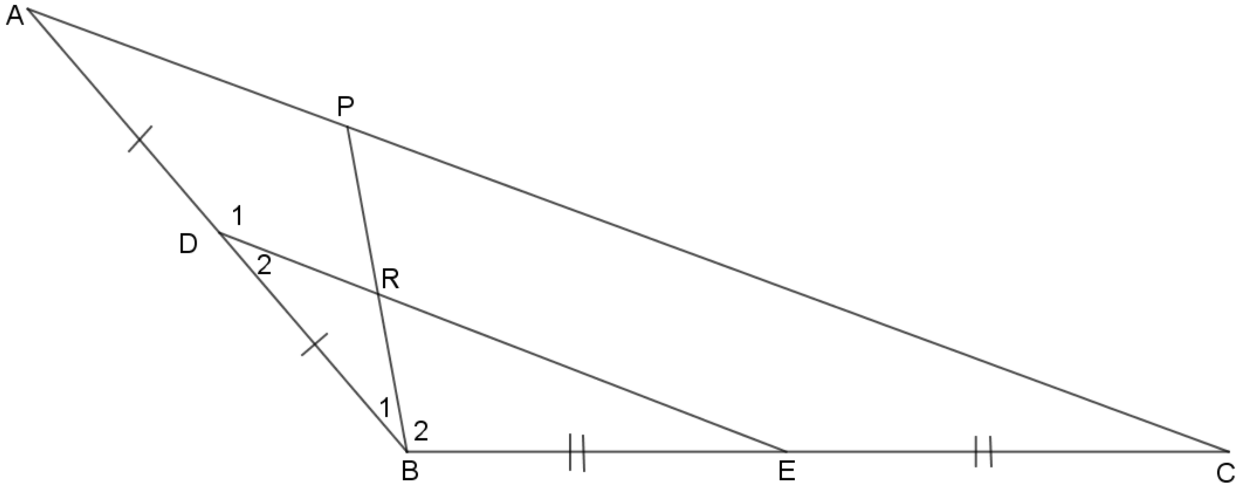
ABCD is ŉ parallelogram met AD // BC en BA // CD.



Gebruik die diagram hierbo en bewys die stelling wat beweer dat die teenoorstaande sye van ŉ parallelogram gelyk is.
[5]

VRAAG 10

In die diagram hieronder is D en E middelpunte van sye AB en BC van ΔABC. Punt P is op BC sodat PA = PB. PB sny DE by R.



Bewys dat ΔRDB gelykbenig is.

[5]

TOTAAL: 100

INLIGTINGSBLAD

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$A = P(1+ni)$ $\quad A = P(1-ni)$ $\quad A = P(1-i)^n$ $\quad A = P(1+i)^n$

$T_n = a + (n-1)d$ $\quad S_n = \frac{n}{2}\left[2a + (n-1)d\right]$

$T_n = ar^{n-1}$ $\quad S_n = \frac{a\left(r^n - 1\right)}{r-1}$; $r \neq 1$ $\quad S_\infty = \frac{a}{1-r}$; $-1 < r < 1$

$F = \frac{x[\left(1+i\right)^n - 1]}{i}$ $\quad P = \frac{x[1-(1+i)^{-n}]}{i}$

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\quad M\left(\frac{x_1 + x_2}{2} ; \frac{y_1 + y_2}{2}\right)$

$y = mx + c$ $\quad y - y_1 = m(x - x_1)$ $\quad m = \frac{y_2 - y_1}{x_2 - x_1}$ $\quad m = \tan\theta$

$(x-a)^2 + (y-b)^2 = r^2$

InΔABC: $\quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$a^2 = b^2 + c^2 - 2bc.\cos A$

oppervlakte $\Delta ABC = \frac{1}{2}\ ab.\sin C$

$\sin(\alpha + \beta) = \sin\alpha.\cos\beta + \cos\alpha.\sin\beta$ $\quad \sin(\alpha - \beta) = \sin\alpha.\cos\beta - \cos\alpha.\sin\beta$

$\cos(\alpha + \beta) = \cos\alpha.\cos\beta - \sin\alpha.\sin\beta$ $\quad \cos(\alpha - \beta) = \cos\alpha.\cos\beta + \sin\alpha.\sin\beta$

$$\cos 2\alpha = \begin{cases} \cos^2\alpha - \sin^2\alpha \\ 1 - 2\sin^2\alpha \\ 2\cos^2\alpha - 1 \end{cases}$$

$\sin 2\alpha = 2\sin\alpha.\cos\alpha$

$\bar{x} = \frac{\sum x}{n}$ $\quad \sigma^2 = \frac{\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2}{n}$

$P(A) = \frac{n(A)}{n(S)}$ $\quad$ P(A of B) = P(A) + P(B) – P(A en B)

$\hat{y} = a + bx$ $\quad b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NOVEMBER EXAMINATION ANSWER BOOK
NOVEMBER EKSAMEN-ANTWOORDBOEK

2022

CANDIDATE'S NAME ***LEERDER SE NAAM***	

DATE ***DATUM***								

BOOK NUMBER ***BOEKNOMMER***		**OF** ***VAN***		**BOOKS** ***BOEKE***

TEACHER **ONDERWYSER**	

PAPER NUMBER/ ***VRAESTELNOMMER***	**2**

SUBJECT NAME ***VAKNAAM***	**MATHEMATICS/*WISKUNDE***

This answer book consists of 14 pages./*Hierdie antwoordboek bestaan uit 14 bladsye.*

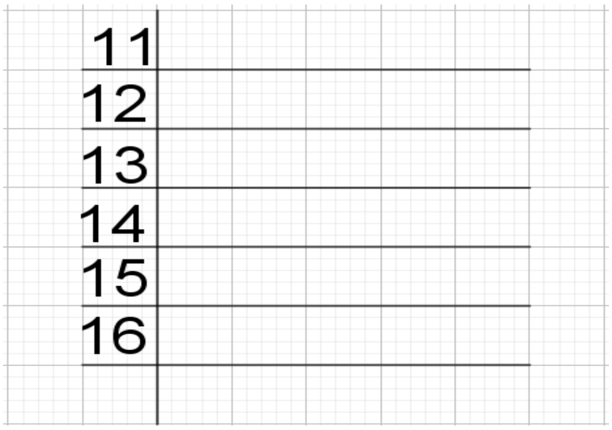
MARKER/*NASIENER*					**MODERATOR'S INITIALS IN RELEVANT BLOCK** ***MODERATOR SE PARAAF IN BETROKKE BLOKKIE***							
Question ***Vraag***	**Marks** ***Punte***			**Marker's Code & Initials/*Nasiener se Kode en parafeer***	**Marks** ***Punte***							
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

				TOTAL ***TOTAAL***				

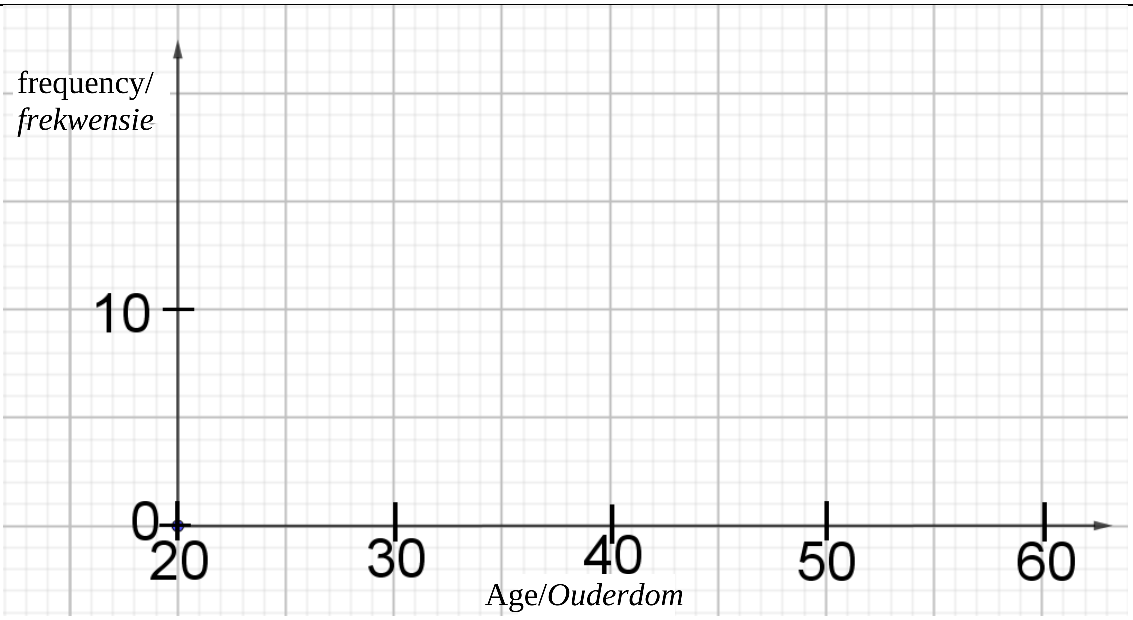
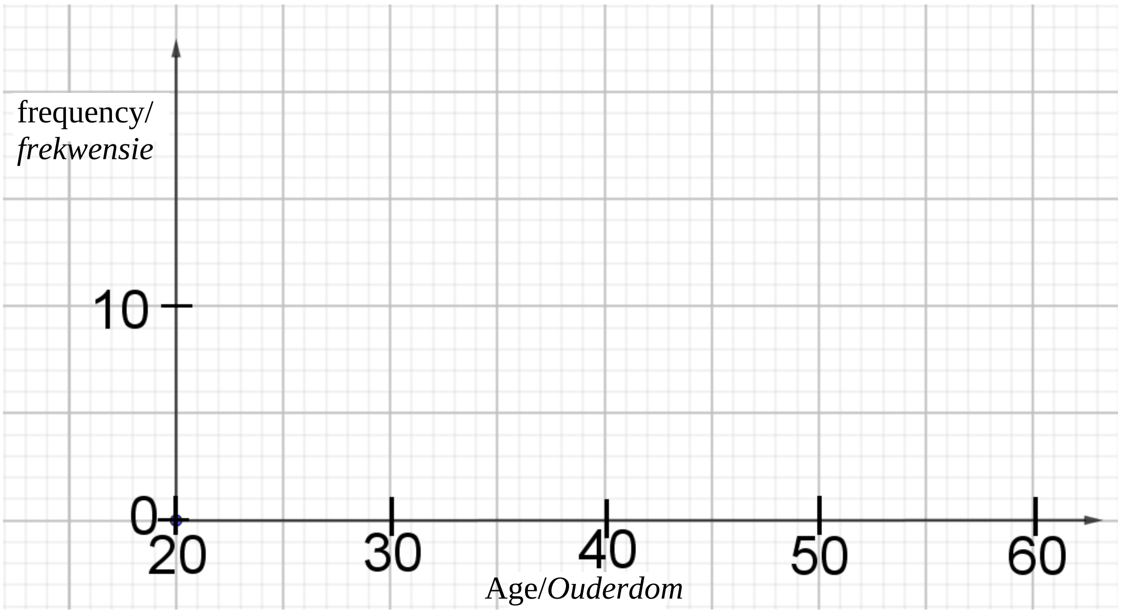
READ THE INSTRUCTIONS ON THE NEXT PAGE.
LEES DIE INSTRUKSIES OP DIE VOLGENDE BLADSY.

FOLLOW THESE INSTRUCTIONS CAREFULLY.	***VOLG HIERDIE INSTRUKSIES NOUKEURIG.***
1. Answer ALL questions in the spaces provided.	*1. Beantwoord ALLE vrae in die ruimtes wat voorsien is.*
2. No pages may be torn from this answer book.	*2. Geen bladsye mag uit hierdie antwoordboek geskeur word nie.*
3. Candidates may not retain an answer book or remove it from the examination room. Answer books must be returned to the invigilator at the end of the examination session.	*3. Geen antwoordboek mag deur kandidate behou of uit die eksamenlokaal verwyder word nie. Antwoordboeke moet aan die toesighouer terugbesorg word aan die einde van die eksamensessie.*
4. Answers must be written in blue ink as distinctly as possible. Do not write in the margins.	*4. Skryf antwoorde so duidelik moontlik met swart/blou ink. Moenie in die kantlyn skryf nie.*
5. Rule-off through any work/rough work that must not be marked.	*5. Trek 'n netjiese lyn deur enige werk/rofwerk wat nie nagesien moet word nie.*
6. In the event that you use the additional space provided:	*6. Ingeval jy die bykomende ruimte wat voorsien word, gebruik:*
6.1 Write down the number of the question.	*6.1 Skryf die nommer van die vraag neer.*
6.2 Leave a line and rule-off after your answer.	*6.2 Laat 'n lyn oop en trek 'n lyn na jou antwoord.*

QUESTION/*VRAAG* 1

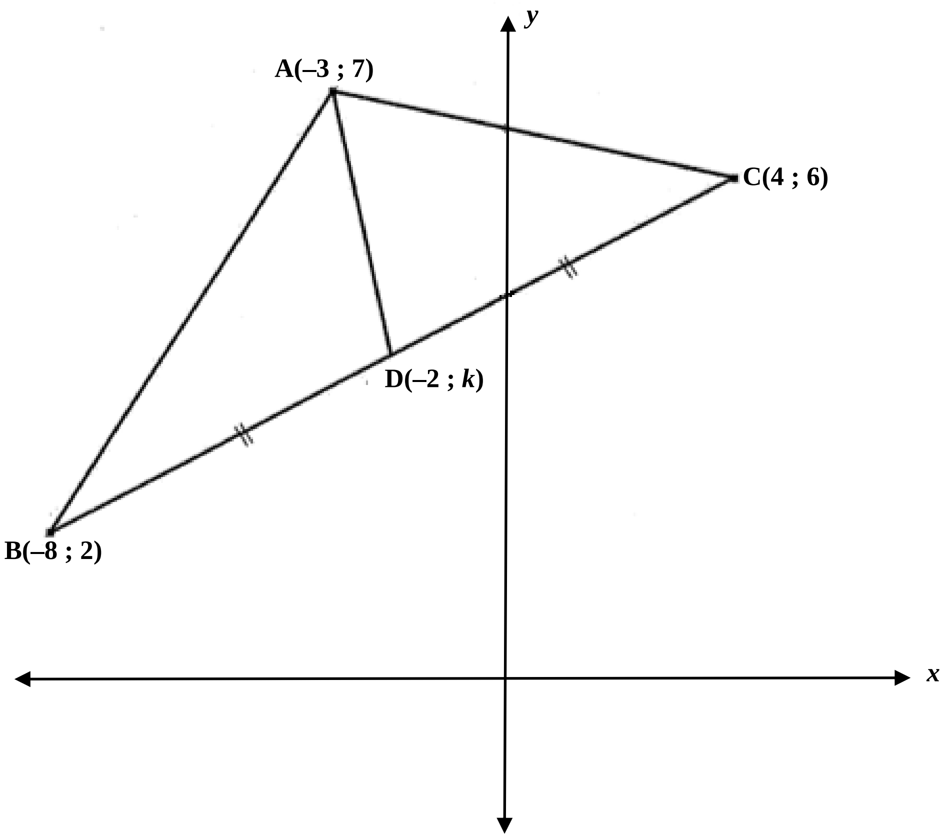
	Solution/*Oplossing*		**Marks/ *Punte***
1.1			(4)
1.2	1.2.1		
			(2)
	1.2.2		
			(1)
	1.2.3		
			(2)
	1.2.4		
			(2)
			[11]

QUESTION/*VRAAG* 2

	Solution/*Oplossing*	**Marks/*Punte***
2.1	(see table below)	(4)
2.2		(2)
2.3		(3)
		[9]

AGE INTERVALS/ *OUDERDOMSINTERVALE*	TALLY/ *TELLING*	FREQUENCY/ *FREKWENSIE*
$25 \leq x < 33$		
$33 \leq x < 41$		
$41 \leq x < 49$		
$49 \leq x < 57$		

QUESTION/*VRAAG* 3

	Solution/*Oplossing*	**Marks/ *Punte***
		
3.1		(2)
3.2		(2)

3.3		
		(2)
3.4		
		(3)
		[9]

QUESTION/*VRAAG* 4

4.1	**Solution/*Oplossing***		**Marks/ *Punte***
	4.1.1		
			(2)
	4.1.2		
			(2)
	4.1.3		
			(2)

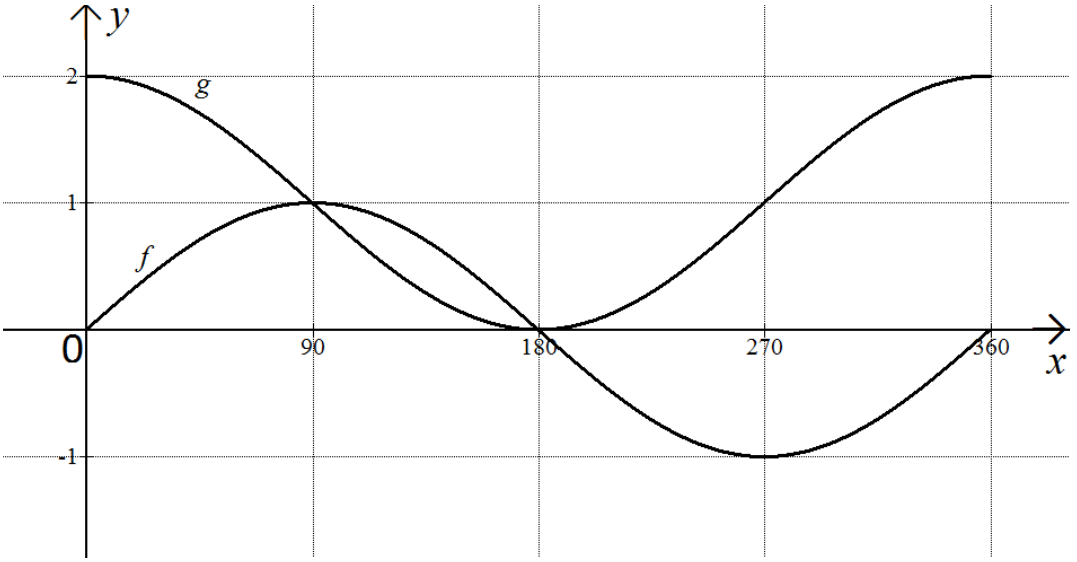
4.2	4.2.1		
			(2)
	4.2.2		
			(3)
	4.2.3		
			(4)
			[15]

QUESTION/*VRAAG* 5

5.1	**Solution/*Oplossing***		**Marks/ *Punte***
	5.1.1		
			(4)
	5.1.2		
			(2)

5.2		
		(4)
5.3		
		(6)
		[16]

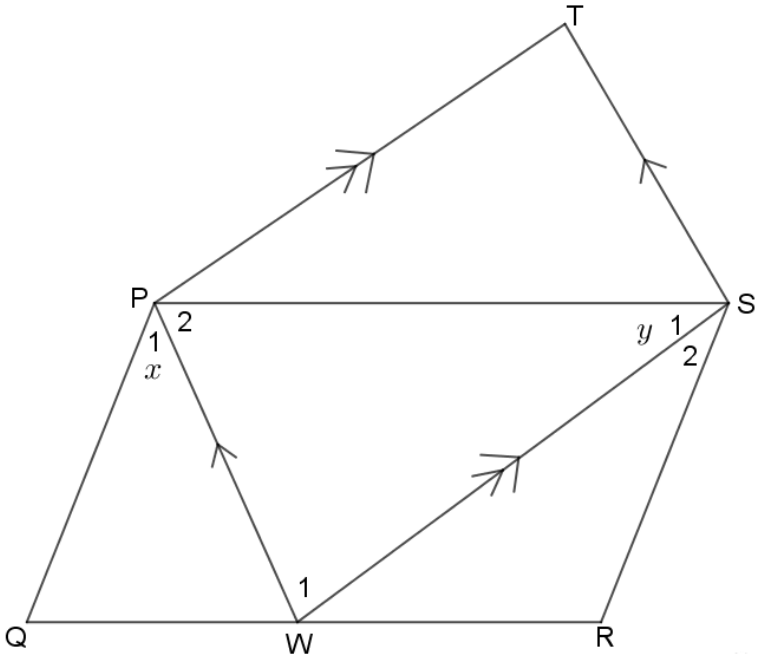
QUESTION/*VRAAG* 6

	Solution/*Oplossing*	**Marks/ *Punte***
		
6.1		(1)
6.2		(2)
6.3		(1)
6.4		(2)
6.5		(3)
6.6		(1)
		[10]

QUESTION/*VRAAG* 7

	Solution/*Oplossing*		Marks/ *Punte*
7.1	7.1.1		(2)
	7.1.2		(2)
	7.1.3		(2)
7.2	7.2.1		(2)
	7.2.2		(2)
	7.2.3		(2)
			[12]

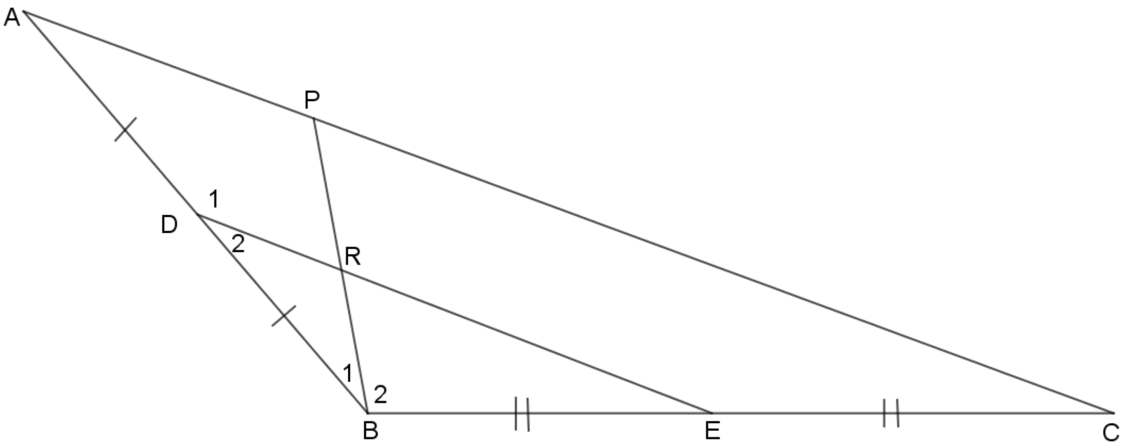
QUESTION/*VRAAG* 8

	Solution/*Oplossing*	**Marks/ *Punte***
		
8.1		(4)
8.2		(4)
		[8]

QUESTION/*VRAAG* 9

	Solution/*Oplossing*	**Marks/*Punte***
		(5)
		[5]

QUESTION/*VRAAG* 10

	Solution/*Oplossing*	**Marks/ *Punte***
		
		[5]

	Additional space/*Bykomende ruimte*	**Marks/*Punte***
		TOTAL/*TOTAAL*:	**100**

END/*EINDE*

PROVINCIAL EXAMINATION/

PROVINSIALE EKSAMEN

NOVEMBER 2022

GRADE 10/*GRAAD 10*

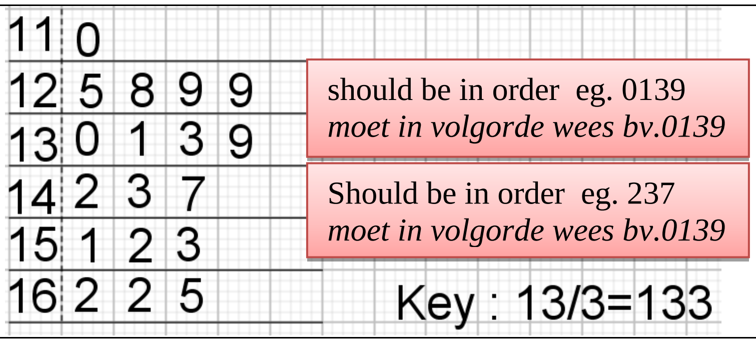
MARKING GUIDELINES/

NASIENRIGLYNE

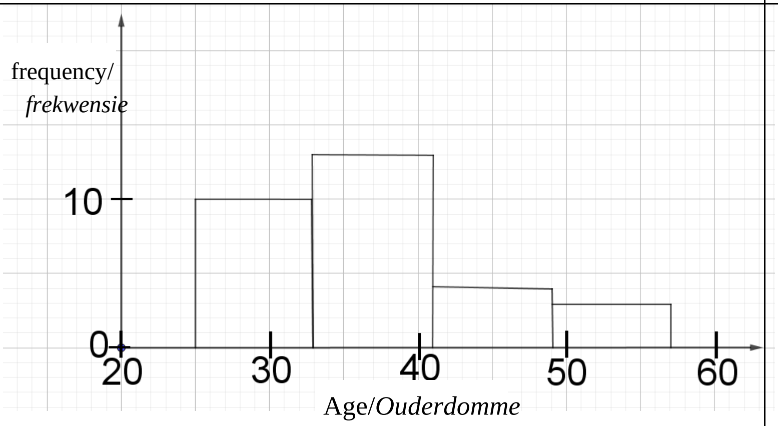
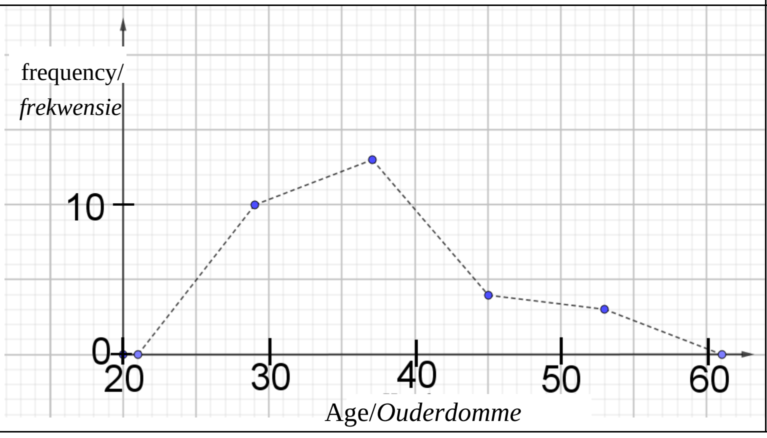
MATHEMATICS (PAPER 2)/*WISKUNDE (VRAESTEL 2)*

10 pages/*bladsye*

QUESTION/*VRAAG* 1

QUESTION/ *VRAAG*		Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	Marks/ *Punte*
1.1			✓ Ist and 2^{nd} leaf *1^{ste} en 2^{de} tak* ✓ 3^{rd} and 4^{th} leaf *3^{de} en 4^{de} tak* ✓ 5^{th} and 6^{th} leaf *5^{de} en 6^{de} tak* ✓ key/*sleutel*	(4)
1.2	1.2.1	$Q_2 = \frac{139+142}{2}$ $= 140{,}5$	✓ method/*metode* ✓ answer/*antwoord*	(2)
	1.2.2	129 and/*en* 162	✓ both values *beide waardes*	(1)
	1.2.3	Lower Quartile/*onderste kwartiel* = 129 Upper Quartile/ *boonste kwartiel* = 152	✓ answer/*antwoord* ✓ answer/*antwoord*	(2)
	1.2.4	$\bar{x} = \frac{\sum x}{n}$ $= \frac{2\,531}{18}$ $= 140{,}61$ Answer ONLY: FULL marks *SLEGS antwoord : VOLPUNTE*	✓ 2 531 ✓ 140,61	(2)
				[11]

QUESTION/*VRAAG* 2

<table>
<tr><th>QUESTION/
VRAAG</th><th>Suggested solution/
Voorgestelde oplossing</th><th>Explanation/
Verduideliking</th><th>Marks/
Punte</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>2.1</td><td>
<table>
<tr><th>AGE INTERVALS
OUDERDOMS-INTERVALLE</th><th>TALLY/
TELLING</th><th>FREQUENCY/
FREKWENSIE</th></tr>
<tr><td>$25 \leq x < 33$</td><td>~~////~~ ~~////~~</td><td>10</td></tr>
<tr><td>$33 \leq x < 41$</td><td>~~////~~ ~~////~~ ///</td><td>13</td></tr>
<tr><td>$41 \leq x < 49$</td><td>////</td><td>4</td></tr>
<tr><td>$49 \leq x < 57$</td><td>///</td><td>3</td></tr>
</table>
</td><td>✓ tallies and f =10/ telling en f =10
✓ tallies and f =13/ telling en f =13
✓ tallies and f = 4 / telling en f =4
✓ tallies and f = 3 / telling en f =3</td><td>(4)</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>2.2</td><td>
</td><td>✓ 1st and 2nd column/ 1ste en 2de kolomme
✓ 3rd and 4th column/ 3rde en 4de kolomme</td><td>(2)</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>2.3</td><td>
</td><td>✓ shape/vorm
✓ (29;10)
(28;13)
(45;4)
(53; 3)
✓ grounding both sides/begronding beide kante
At/By (21;0)
and/en (61;0)</td><td>(3)</td></tr>
<tr><td></td><td></td><td></td><td>[9]</td></tr>
</table>

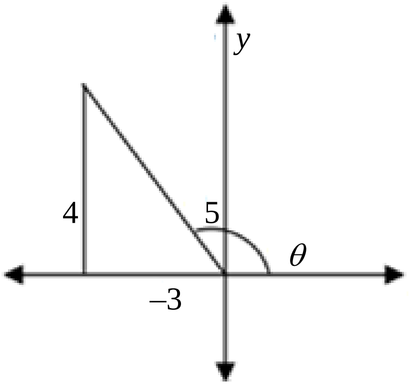
QUESTION/*VRAAG* 3

QUESTION/ *VRAAG*	Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	Marks/ *Punte*
3.1	$m_{BC} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{6-2}{4+8}$ $= \frac{1}{4}$	✓ substitution/*vervanging* ✓ answer/*answer*	(2)
3.2	BC = $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ BC = $\sqrt{(4+8)^2 + (6-2)^2}$ BC = 12,65 OR $4\sqrt{10}$	✓ substitution/*vervanging* ✓ answer/*answer*	(2)
3.3	$k = \frac{6+2}{2}$ $= 4$	✓ correct substitution/ *korrekte vervanging* ✓ answer/*antwoord*	(2)
3.4	For AD$\perp$ BC $m_{BC} \times m_{AD} = -1$ $m_{AD} = \frac{7-4}{3+2}$ $m_{AD} = -3$ $\therefore \frac{1}{4} \times -3 \neq -1$ $\therefore$ AD not $\perp$ BC AD *nie* $\perp$ *op* BC	✓ deduction/*afleiding* ✓ substitution/*vervanging* ✓ answer/*antwoord*	(3)
			[9]

QUESTION/*VRAAG* 4

QUESTION/ *VRAAG*		Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	*Punte/* Marks
4.1	4.1.1	$\cos(x+y)$ $= \cos(66{,}4° + 114{,}7°)$ $= \cos(181{,}1°)$ $= -1{,}00$	✓ substitution/*vervanging* ✓ answer/*antwoord*	(2)
	4.1.2	$2\sin x$ $= 2\sin(66{,}4°)$ $= 1{,}83$	✓ substitution/*vervanging* ✓ answer/*antwoord*	(2)
	4.1.3	$\text{cosec}\ x$ $\dfrac{1}{\sin(66{,}4°)}$ $= 1{,}09$	✓ correct substitution/ *korrekte vervanging* ✓ answer/*antwoord*	(2)
4.2	4.2.1	$\sin\theta + 0{,}38 = 1$ $\sin\theta = 0{,}62$ $\theta = 38{,}3°$ Penalise 1 mark for incorrect rounding off/ *Penaliseer 1 punt vir verkeerde afronding*	✓ 0,62 ✓answer/*antwoord*	(2)
	4.2.2	$2\cot 2\theta = 3$ $2\cot 2\theta = \frac{3}{2}$ $2\theta = \tan^{-1}(\frac{2}{3})$ $2\theta = 33{,}69\ \ldots°$ $\theta = 16{,}8°$	✓ $\frac{3}{2}$ ✓ $\tan^{-1}(\frac{2}{3})$ OR/*OF* $2\theta = 33{,}69\ \ldots°$ ✓ answer/*antwoord*	(3)
	4.2.3	$2\cos(3\theta - 60°) = 1{,}71$ $\cos(3\theta - 60°) = 0{,}855$ $3\theta - 60° = 31{,}24\ \ldots°$ $3\theta = 91{,}24\ \ldots°$ $\theta = 30{,}4°$	✓ 0,855 ✓ $3\theta - 60° = 31{,}24°$ ✓ $3\theta = 91{,}24°$ ✓ answer/*antwoord*	(4)
				[15]

QUESTION/*VRAAG* 5

QUESTION/ *VRAAG*		Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	*Punte/* Marks
5.1	5.1.1	 $y^2 = (5)^2 - = (4)^2$ Pythagoras; 90°∠ $y^2 = 25 - 16$ $y = -3$ $\tan\theta = -\frac{4}{3}$	✓ diagram ✓ S ✓ $y = -3$ ✓ answer/*antwoord*	(4)
	5.1.2	$2\cos^2\theta - 1$ $= 2\left(-\frac{3}{5}\right)^2 - 1$ $= -\frac{7}{25}$	✓ $2\left(-\frac{3}{5}\right)^2 - 1$ ✓ answer/*antwoord*	(2)
5.2		$\cos 0° + \sin^2 60° + \sqrt{2} \cdot \sec 45°$ $= 1 + \left(\frac{\sqrt{3}}{2}\right)^2 + \sqrt{2} \cdot \frac{2}{\sqrt{2}}$. $3\frac{3}{4}$ **OR/*OF*** $\frac{15}{4}$	✓ 1 ✓ $\left(\frac{\sqrt{3}}{2}\right)^2$ ✓ $\sqrt{2} \cdot \frac{2}{\sqrt{2}}$ ✓ answer/*antwoord*	(4)
5.3		Distance/*Afstand* DB: $\tan 21° = \frac{DB}{30}$ DB = 11,515 … *m* Distance/*Afstand* BC: $\tan 15° = \frac{BC}{30}$ BC = 8,038 … *m* ∴ DC = 11,515 *m* – 8,038 *m* ∴ DC = 3,48	✓ $\tan 21° = \frac{DB}{30}$ ✓ DB = 11,515 *m* ✓ $\tan 15° = \frac{BC}{30}$ ✓ BC = 8,038 *m* ✓ DC = 11,515 *m* – 8,038 *m* ✓ answer/*antwoord*	(6)
				[16]

QUESTION/*VRAAG* 6

QUESTION/ *VRAAG*	Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	*Punte/* Marks
6.1	$a = 1$	✓ 1	(1)
6.2	$y \in [0;2]$ **OR/*OF*** $0 \leq y \leq 2;\ y \in R$ **NOTE/*NOTA*** In this type of answers – look at values and give the mark. Then look at inequalities. If values are wrong, then ZERO marks *In hierdie tipe antwoorde – kyk na waardes en gee die punt. Kyk dan na ongelykhede. As waardes verkeerd is, dan NUL*	✓ critical values/*kritieke waardes* ✓ notation/*notasie*	(2)
6.3	1	✓ 1	(1)
6.4	$90° \leq x \leq 180°$ **OR/*OF*** $x \in [90°;180°]$ See note above *Sien nota hierbo*	✓ values/waardes ✓ inequality signs/ *ongelykheidstekens*	(2)
6.5	$x = 0°$ or/*of* $x = 270°$ or/*of* $x = 360°$	✓ $x = 0°$ ✓ $x = 270°$ ✓ $x = 360°$	(3)
6.6	$h(x) = -\sin x$	✓answer/*antwoord*	(1)
			[10]

QUESTION/*VRAAG* 7

QUESTION/ *VRAAG*		Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	*Punte/* Marks
7.1	7.1.1	$AH^2 = 0{,}8^2 + 1{,}5^2$ $AH^2 = 2{,}89$ AH = 1,7 m	✓ $AH^2 = 0{,}8^2 + 1{,}5^2$ ✓ answer/*antwoord*	(2)
	7.1.2	Surface area of roof/*Buite-oppv van dak* $= 4 \times \frac{1}{2}(3 \times 1{,}7)$ $= 10{,}2\ m^2$	✓ $4 \times \frac{1}{2}(3 \times 1{,}7)$ ✓ answer/*antwoord*	(2)
	7.1.3	Surface area of walls/*Buite-oppv van mure* $= 4 \times 3 \times 2{,}1$ $= 25{,}2\ m^2$ Total surface area*/Totale oppv* $= 10{,}2\ m^2 + 25{,}2\ m^2 = 35{,}4\ m^2$	✓ $= 25{,}2\ m^2$ ✓ answer/*antwoord*	(2)

QUESTION/ *VRAAG*		Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	*Punte/* Marks
7.2	7.2.1	Volume = $\frac{4}{3}\pi r^3$ $= \frac{4}{3}\pi \times 8^3$ $= 2\ 144{,}62\ m^3$	✓ $= \frac{4}{3}\pi \times 8^3$ ✓ answer/*antwoord*	(2)
	7.2.2	New volume/*Nuwe volume* : Orig volume/*Oorspronklike volume* $= 2^3 : 1$ $= 8:1$	✓2^3 ✓answer/*antwoord*	(2)
	7.2.3	Volume including silver/*Volume met silwer ingesluit* $= \frac{4}{3}\pi \times 9^3 = 3\ 053{,}66\ mm^3$ Volume of silver/*Volume van silwer* $= 3\ 053{,}66 - 2\ 144{,}62 = 908,\ \text{mm}^3$	✓ $\frac{4}{3}\pi \times 9^3$ ✓ answer/*antwoord*	(2)
				[12]

QUESTION/*VRAAG* 8

8.1	$\hat{P}_1 = \hat{P}_2 = x$ $\hat{S}_1 = \hat{S}_2 = y$ $x + x + y + y = 180°$ $2x + 2y = 180°$ $\therefore x + y = 90°$	[given/*gegee*] [given/*gegee*] [co-interior < s PQ // SR/ *ko-binne* $<^e$; PQ // SR]	✓ S ✓ S ✓ S ✓ R	(4)
8.2	$\hat{W}_1 + x + y = 180°$ $\hat{W}_1 = 90°$ PWST is a parallelogram/ PWST *is 'n parallelogram* $\therefore$ PWST is a rectangle PWST *is 'n reghoek*	[sum int < of $^{\Delta}$/ *som binne* $<^e$ *van* Δ] [both pairs of opp sides parallel/*albei pare teenoorstaande sye ewewydig*] [$\hat{W}_1 = 90°$ and PWST is a parm $\hat{W}_1 = 90°$ *en* PWST *is 'n parm*]	✓ S/R ✓ S ✓ S ✓ R	(4)
				[8]

QUESTION/*VRAAG* 9

BD = *BD*	[common/*gemeenskaplik*]	✓ S	
$\hat{D}_1 = \hat{B}_2$	[alternate < s AD // BC/ *verw.binne* <^{e} ; AD // BC]	✓ S/R	
$\hat{B}_2 = \hat{D}_1$	[alternate < s AB // DC *verw.binne* <^{e} ; AB // DC]	✓ S	
$\therefore \Delta ABC \equiv \therefore \Delta CBD$	[AAS/*HHS*]	✓ S	
$\therefore \Delta AD$ = BC, AB = DC	$\Delta^{'s}/\Delta^{'e} \equiv$	✓ R	(5)
			[5]

QUESTION/*VRAAG 10*

DE // BC	[midpoint theorem/*middelpunt stelling*]	✓ S ✓ R	
$\hat{D}_2 = \hat{A}$	[corresponding < s DE // BC ooreenkomstige <^{e} ; DE // BC]	✓ S/R	
$\hat{B}_1 = \hat{A}$	[< s opp = sides /<^{e} *teenoor gelyke sye*]	✓ S/R	
$\hat{D}_2 = \hat{B}_1$			
DR = RB	[sides opp equal $\angle^s$ / *sye teenoor gelyke* $\angle^e$]	✓ S/R	
ΔRDB is isosceles ΔRDB is gelykbenig	[two equal angles/*twee gelyke hoeke]*		(5)
			[5]
		TOTAL/*TOTAAL*:	**100**