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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION/

PROVINSIALE EKSAMEN

NOVEMBER 2022

GRADE 10/*GRAAD 10*

MARKING GUIDELINES/

NASIENRIGLYNE

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

10 pages/*bladsye*

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QUESTION/*VRAAG* 1

QUESTION/ *VRAAG*		Suggested solution/ *Voorgestelde oplossing*	Explanation/ *Verduideliking*	Marks/ *Punte*
1.1		11 | 0 12 | 5 8 9 9 13 | 0 1 3 9 14 | 2 3 7 15 | 1 2 3 16 | 2 2 5 Key : 13/3=133 should be in order eg. 0139 *moet in volgorde wees bv.0139* Should be in order eg. 237 *moet in volgorde wees bv.0139*	✓ Ist and 2nd leaf *1ste en 2de tak* ✓ 3rd and 4th leaf *3de en 4de tak* ✓ 5th and 6th leaf *5de en 6de 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	$x = \frac{\sum x}{n}$ $= \frac{2\,531}{18}$ $= 140,61$ Answer ONLY: FULL marks *SLEGS antwoord : VOLPUNTE*	✓ 2 531 ✓ 140,61	(2)
				[11]

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QUESTION/*VRAAG* 2

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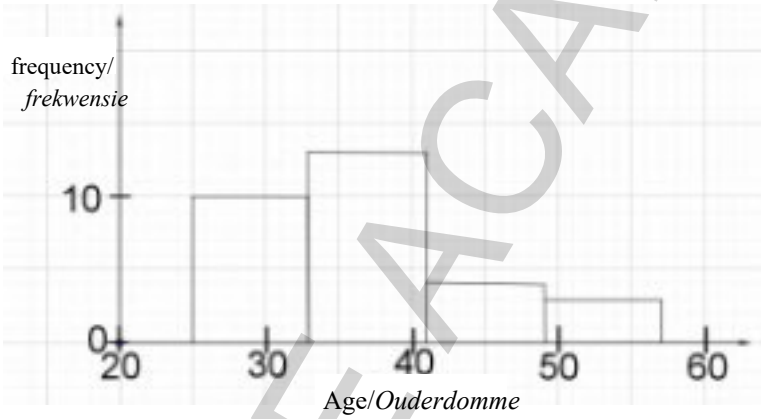
2.1

AGE INTERVALS *OUDERDOMS-INTERVALLE*	TALLY/ *TELLING*	FREQUENCY/ *FREKWENSIE*
$25 \leq x < 33$	~~////~~ ~~////~~	**10**
$33 \leq x < 41$	~~////~~ ~~////~~ ///	**13**
$41 \leq x < 49$	////	**4**
$49 \leq x < 57$	///	**3**

✓ 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

(4)

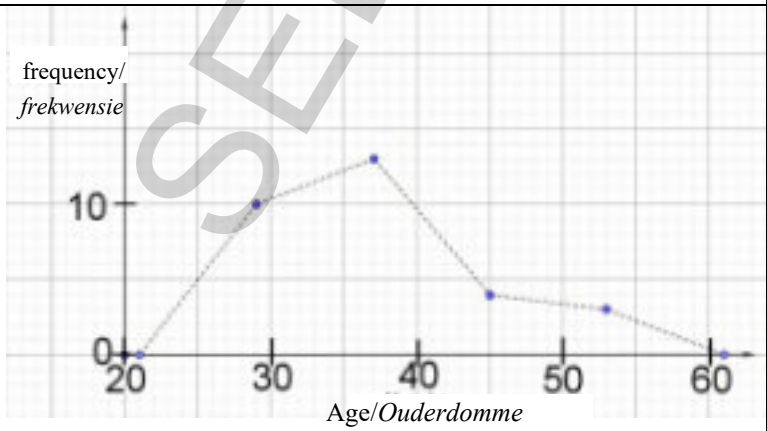
2.2



✓ 1st and 2nd column/ *1ste en 2de kolomme*
✓ 3rd and 4th column/ *3rde en 4de kolomme*

(2)

2.3



✓ shape/*vorm*
✓ (29;10)
(28;13)
(45;4)
(53; 3)
✓ grounding both sides/*begronding beide kante*
At/*By* (21;0)
and/*en* (61;0)

(3)

[9]

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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]

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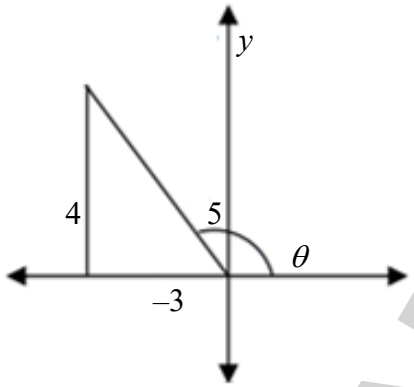
QUESTION/*VRAAG* 4

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	$\text{cosec } x$ $\frac{1}{\sin(66,4°)}$ $= 1,09$	✓ 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]

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QUESTION/*VRAAG* 5

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

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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	$h(x) = -sinx$	✓ answer/*antwoord*	(1)
			[10]

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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)

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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* $= 3\ 053{,}66 - 2\ 144{,}62 = 908,\ mm^3$	✓ $\frac{4}{3}\pi \times 9^3$ ✓ 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 Δ/ *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]

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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**

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