PROVINCIAL EXAMINATION/ *PROVINSIALE EKSAMEN*

NOVEMBER 2021

GRADE 10/*GRAAD 10*

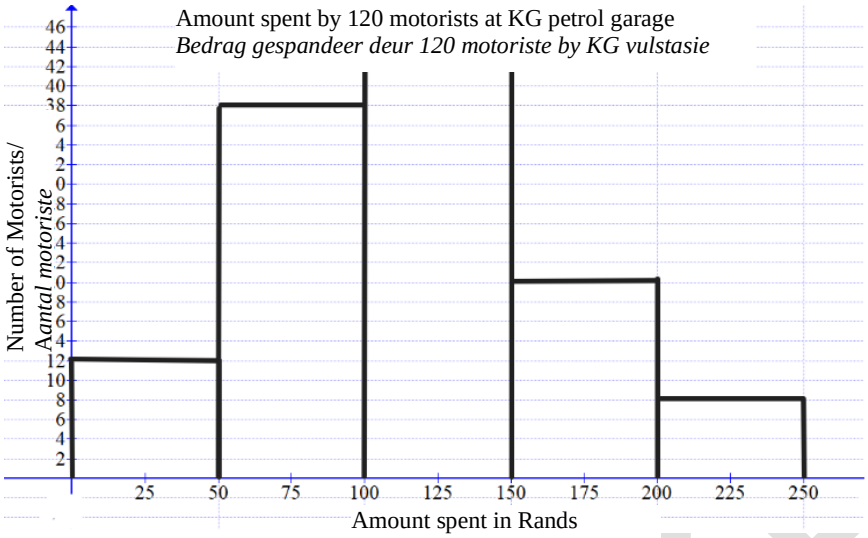
MARKING GUIDELINES/*NASIENRIGLYNE*

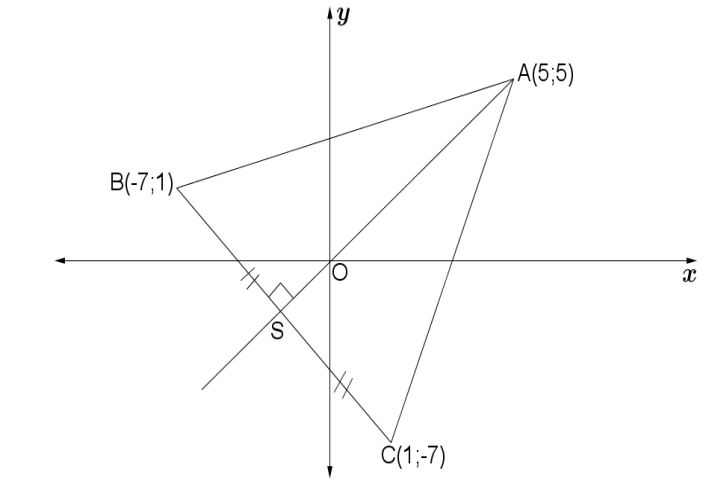
MATHEMATICS/*WISKUNDE*

(PAPER/*VRAESTEL 2*)

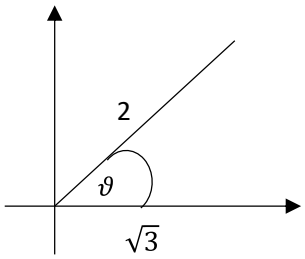
10 pages/*bladsye*

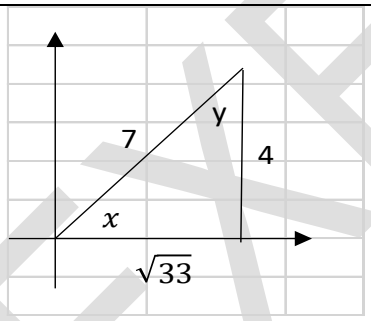
1.	SUGGESTED SOLUTIONS/*VOORGESTELDE OPLOSSINGS*		EXPLANATION *VERDUIDELIKING*	MARKS *PUNTE*
1.1	30		✓ Answer/*Antwoord*	(1)
1.2	1.2.1	35	✓ Answer/*Antwoord*	(1)
	1.2.2	30	✓ Answer/*Antwoord*	(1)
	1.2.3	38,5	Answer/*Antwoord* ✓ Accept 38 or 39/*Aanvaar 38 of 39*	(1)
1.3	Range = Max. – Min./ *Omvang = Maks. – Min.* = 44 – 24 = 20		✓ Method/*Metode* ✓ Answer/*Antwoord*	(2)
1.4	No. of packets of sweets above upper quartile/ *Aantal pakkies lekkers bo die boonste kwartiel* $= \frac{6}{25} \times 100\%$ = 24%		✓ Method/*Metode* ✓ Answer/*Antwoord*	(2)
				[8]

2.			
2.1	$200 < x \leq 250$	✓ Answer/ *Antwoord*	(1)
2.2	**HISTOGRAM** Amount spent by 120 motorists at KG petrol garage *Bedrag gespandeer deur 120 motoriste by KG vulstasie*  	✓ 1st & 2nd columns/ *1ste en 2de kolomme* ✓ Last three columns/ *Laaste drie kolomme*	(2)
2.3	$\frac{30}{100} \times 120 = 36^{\text{th}}$ value/*36ste waarde* $\therefore$ interval is/*interval is* $50 < x \leq 100$	✓ 36 ✓ Answer/ *Antwoord*	(2)
2.4	$\frac{42}{120} \times 360° = 126°$	✓ 42 ✓ Answer/ *Antwoord*	(2)
			[7]

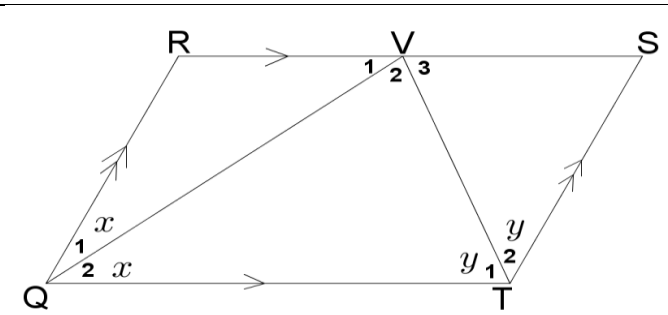
3.			
			
3.1	$\left(\frac{x_1+x_2}{2}\ ;\frac{y_1+y_2}{2}\right)$ $S\left(\frac{-7+1}{2}\ ;\frac{1+(-7)}{2}\right)$ $\therefore S(-3\ ;-3)$	Wrong Formula NO Marks/ *Verkeerde Formule GEEN punte nie* ✓ Formula/*Formule* ✓ $x = -3$; ✓ $y = -3$	(3)
3.2	$m_{AC} = \frac{y_2-y_1}{x_2-x_1}$ $= \frac{5-(-7)}{5-1}$ $= 3$	Wrong Formula NO Marks/ *Verkeerde Fomule GEEN punte nie* ✓ Formula/*Formule* ✓ Answer/*Antwoord*	(2)
3.3	$BC = \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$ $BC = \sqrt{(-7-1)^2 + (1-(-7))^2}$ $BC = 8\sqrt{2}$ $AS = \sqrt{(5-(-3)^2 + (5-(-3))^2}$ $AS = 8\sqrt{2}$	✓ Formula/*Formule* ✓ Correct substitution/*Korrekte vervanging* ✓ BC	(3)

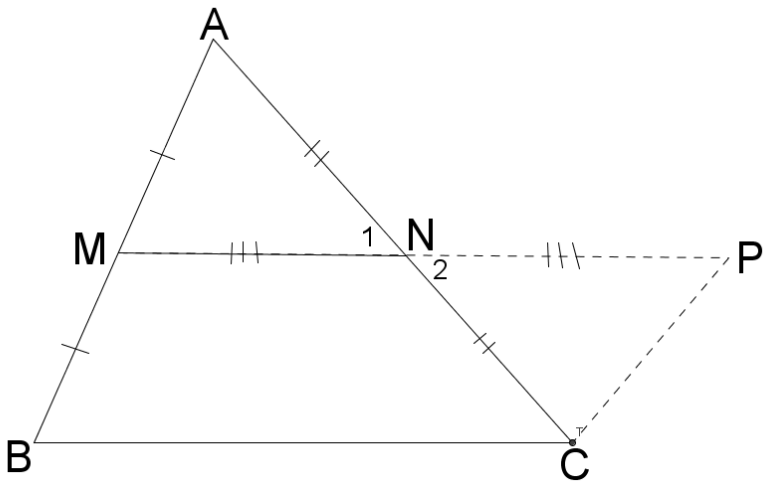
3.4	$BC = 8\sqrt{2}$ $AS = \sqrt{(5-(-3)^2 + (5-(-3))^2}$ $AS = 8\sqrt{2}$ Area of/area $\Delta ABC = \frac{1}{2}\cdot$base height/ *Area van/Area* $\Delta ABC = \frac{1}{2}$ *basis hoogte* $= \frac{1}{2}\cdot 8\sqrt{2}\cdot 8\sqrt{2}$ AS = 64 unit^2/*eenheid*^{2} **OR/*OF*** $BS = \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$ $BS = \sqrt{(-7+3)^2 + (1+3)^2}$ $BS = 4\sqrt{2}$ $AS = \sqrt{(5-(-3)^2 + (5-(-3))^2}$ $AS = 8\sqrt{2}$ Area of $\Delta ABC = 2\times\frac{1}{2}\cdot$ base height/ *Area van* $\Delta ABC = 2\times\frac{1}{2}\cdot$ *basis hoogte* $= 2\times\frac{1}{2}\ 4\sqrt{2}\ 8\sqrt{2}$ AS = 64 unit^2/*eenheid*^{2}	✓ BC ✓ Formula/*Formule* ✓ AS ✓ Method/*Metode* ✓ Answer/*Antwoord* ✓ Formula/*Formule* ✓ BS ✓ AS ✓ Method/*Metode* ✓ Answer/*Antwoord*	(5)
			[13]

4.				
4.1	4.1.1	$y^2 = (2)^2 - \left(\sqrt{3}\right)^2$ $= 4 - 3$ $\therefore\ y = 1$ $\therefore\ \sin\theta = \frac{1}{2}$  	✓ sub in Pythagoras/ *vervang in Pythagoras* ✓ $y = 1$ ✓ 1/2 ✓ diagram/*diagram*	(3)
	4.1.2	$\sin\theta.\cos\theta$ $= \left(\frac{1}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$ $= \frac{\sqrt{3}}{4}$	✓ Sub.into cosθ/ *Vervang in cosθ* ✓ $\frac{\sqrt{3}}{4}$	(2)
4.2	$\frac{1}{2}sin\ 2y - [2\ tan^2\left(\frac{x}{2}\right)]\cos\ x$ $\frac{1}{2}\sin 2(45°) - [2\ tan^2\left(\frac{60°}{2}\right)]\cos\ 60°$ $= \frac{1}{2}(1) - [2(\frac{\sqrt{3}}{2})^2](\frac{1}{2})$ $= \frac{3-2\sqrt{3}}{6}$	✓ Correct substitution/ *Korrekte vervanging* ✓ $\frac{1}{2}(1)$ ✓ $[2(\frac{\sqrt{3}}{2})^2$ ✓ $\frac{1}{2}$ ✓ $\frac{3-2\sqrt{3}}{6}$	(6)

4.3	4.3.1	$\sin(\beta - 17.8°) = 0.215$ $\beta - 17.8° = 12.4155°$ $\beta = 12.4155° + 17.8°$ $\beta = 30.22°$	✓ 12,4155° ✓ +17,8° ✓Answer/*Antwoord*	(3)
	4.3.2	$tan\ 3\beta = \sqrt{3}$ $3\beta = 60°$ $\beta = 20°$	✓60° ✓ Answer/*Antwoord*	(2)
	4.3.3	$3sin\ \frac{\beta}{2} = 2.012$ $sin\ \frac{\beta}{2} = 0.670666$ $\frac{\beta}{2} = 41.11848°$ $\beta = 84.24°$	✓ $sin\ \frac{\beta}{2} = 0,670666$ ✓ $\frac{\beta}{2} = 41,11848°$ ✓ Answer/*Antwoord*	(3)
4.4	$\frac{\tan 30 cosec\ 60°}{cot 45° sin 45°}$ $= \frac{\frac{\sqrt{3}}{3}.\frac{2}{\sqrt{3}}}{1.\frac{\sqrt{2}}{2}}$ $= \frac{4}{3}$		✓ $\frac{\sqrt{3}}{3}$ ✓ $\frac{2}{\sqrt{3}}$ ✓ 1 ✓ Answer/*Antwoord*	(4)
				[23]
5.				
5.1	 $\sin x = \frac{4}{7}$ $\tan y = \frac{\sqrt{33}}{4}$ But/*Maar*: $\tan y = t$ $\therefore t^2 = (\frac{\sqrt{33}}{4})^2$ $t = \frac{33}{16}$		✓ diagram/*diagram* ✓ $\sin x = \frac{4}{7}$ ✓ $\tan y = \frac{\sqrt{33}}{4}$ ✓ $\tan y = t$ ✓ $t^2 = (\frac{\sqrt{33}}{4})^2$ ✓ Answer/*Antwoord*	(6)

5.2	5.2.1	$1 - cos^2x - sin^2\ x$ $1 - (sin^2\ x + cos^2x\ )$ $= 1 - 1$ $= 0$	✓ $-(sin^2\ x + cos^2x\ )$ ✓ Simplification/ *Vereenvoudiging* ✓ Answer/*Antwoord*	(3)
	5.2.2	$cos^2x + \tan x.cotx + sin^2\ x$ $cos^2 + sin^2\ x + \frac{sinx}{cosx}.\frac{\cos x}{\sin x}$ $= 1 + 1$ $= 2$	✓rearrangement and identity/ *herrangskikking en identiteit* ✓ Simplification/ Vereenvoudig ✓ Answer/*Antwoord*	(3)
5.3	$\angle SME = 34.4°$ $(alt./verw.\ binne\ .\angle s)$ $\angle SHE = 26.2°$ $(alt./verw.\ binne\ .\angle s)$ Disance/*Afstand* SM: $tan34.4° = \frac{55}{SM}$ $SM = 80.3254\ m$ Distance/*Afstand* SH:$\tan 26.2° = \frac{55}{SH}$ $SH = 111.77\ m$ $\therefore 80.3254\ m + 111.77m - 80.3254\ m$ $= 31.45\ m$		✓ Deductions/ *Aftrekkings* ✓ $tan34.4° = \frac{55}{SM}$ ✓ $SM = 80.3254\ m$ ✓ $SH = 111.77\ m$ ✓ Answer/*Antwoord*	(5)
				[17]
6.				
6.1	$a = -2$ $b = 1$		✓ $a = -2$ ✓ $b = 1$	(2)
6.2	$0^\circ < x < 180^\circ$ **OR/*OF*** $x \in (0^\circ;180^\circ)$		✓Inequality signs/ *Ongelykheidstekens* ✓Critical points/*Kritieke punte*	(2)
6.3	2		✓ 2	(1)

6.4	$-1 \le y \le 1$ **OR/*OF*** $y \in [-1;1]$	✓ Inequality signs/ *Ongelykheidstekens* ✓ Critical points/ *Kritieke punte*	(2)
6.5	$x = 270°$	✓ Inequality signs/ *Ongelykheidstekens* ✓ Critical points/ *Kritieke punte*	(2)
			[9]
7.			
			
7.1	$R\hat{Q}T + Q\hat{T}S = 180°$ $\widehat{[\text{Coınterıor} < \text{s ; RQ II ST}]}$/ *[ko-binnehoeke ; RQ || ST]* $2x + 2y = 180°$ $x + y = 90°$ $\hat{V}_2 + \hat{Q}_2 + \hat{T}_1 = 180°$ [sum of int/*som van binne* $\angle^e$ van Δ]/ $x + y + \hat{V}_2 = 180°$ $90° + \hat{V}_2 = 180°$ $\hat{V}_2 = 90°$	✓✓ S/R ✓ S ✓ S/R ✓ S	(5)
7.2	$\hat{V}_1 = x$ [Alt < s ; RS II QT/*Verw binne $\angle^e$ RS II QT]* $RQ = RV$ [sides opp equal angles/*sye teenoor gelyke hoeke]* $RQ = ST$ [opp sides of a parallelogram/*teenoorst. sye van ||^{m}]* $\hat{V}_3 = \hat{T}_1$ [Alt < s ; RS II QT/ *Verw binne $\angle^e$ RS II QT*] $VS = ST$ [sides opp equal angles/*sye teenoor gelyke hoeke]* $RQ = RV$ [sides opp equal angles/*sye teenoor gelyke hoeke]* $VS = RQ = RV$ $RS = 2RQ$	✓ S ✓ S/R ✓ S/R ✓ S ✓ S ✓ S	(6)
			[11]

8.			
8.1	 MN = NP {construction/*konstruksie*] $\widehat{N}_1 = \widehat{N}_2$ Vertically opposite angles/ *Regoorst* $\angle^e$ AN=AC given/*gegee* $\Delta MNA \equiv \Delta PNC$ *SAS* / s∠s MA = CP $(\equiv \Delta s)$ /$\Delta^e \equiv$ MP = BC and MB = PC ∴ MPCB is a parallelogram [both pairs of opp side =] *MPCB is 'n* $\|\|^m$ *[beide pare teenoorst sye =*] MN // BC [opp sides of //gm/*teenoorst sye van* $\|\|^m$]	✓ construction/ *konstruksie* / ✓ S ✓ S/R ✓ S ✓ S/R ✓ S ✓ R	(6)

8.2	TS // UR [midpoint theorem/*middelpuntt stelling*]
	UR=2TS
	TS=2x [Converse midpoint theorem/*omgekeerde midpt stelling*]
	UR=2TS=4x
	UR=UV+VR
	VR=3x
	OR/OF
	UT = TQ and QS = SR $[\frac{\text{given}}{\textit{gegee}}]$
	TS||UR and TS = $\frac{1}{2}$UR [midpt theorem/*midpt stelling*]
	In ΔPTS
	TU = UP [given/*gegee*]
	TS||UV [proven/*bewys*]
	PV = VS and UV = $\frac{1}{2}$TS [converse; midpt theorem/ *omgekeerde midpt stelling*]
	TS = 2x
	UR = 4x
	VR = 3x
		✓ S/R
		✓ S
		✓ S/R
		✓ S
		✓ S
		
		✓ S
		✓ S/R
		✓ S
		✓ S/R
		✓ S
		✓ S
			(6)

			[12]
		TOTAL/*TOTAAL*:	**100**