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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION/
GAUTENGSE DEPARTEMENT VAN ONDERWYS
PROVINCIAL EXAMINATION/
PROVINSIALE EKSAMEN
NOVEMBER 2020
GRADE/GRAAD 9**

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

MARKING GUIDELINES/NASIENRIGLYNE

6 pages/bladsye

**MEMORANDUM /
NASIENRIGLYNE**
**MATHEMATICS P2/ WISKUNDE V2
GRADE / GRAAD 9**
QUESTION/VRAAG 1

1.1	C✓	(1)
1.2	A✓	(1)
1.3	C✓	(1)
1.4	D✓	(1)
1.5	A✓	(1)
		[5]

QUESTION/VRAAG 2

2.1.1	Statement/Bewering	Reason/Rede	1 mark for statement & reason/ 1 punt vir bewering & rede (1)
	$x = 45^\circ$	alt. $\angle s$ & $AB \parallel CD$ / verw. $\angle e$ & $AB \parallel CD$ ✓	
2.1.2	Statement/Bewering	Reason/Rede	1 mark for statement & reason/ 1 punt vir bewering & rede 1 mark for $\hat{C}_1 = 75^\circ$ / 1 punt $\hat{C}_1 = 75^\circ$ 1 mark for $\widehat{ACD} = 120^\circ$ / 1 punt vir $\widehat{ACD} = 120^\circ$ 1 mark for statement & reason/ 1 punt vir bewering & rede 1 mark for answer/ 1 punt vir antwoord
	$\hat{C}_1 + 60^\circ + 45^\circ = 180^\circ$ $\hat{C}_1 = 180^\circ - 105^\circ = 75^\circ$ ✓	sum int. $\angle s$ of Δ / som binne $\angle e$ van Δ ✓	
	$\widehat{ACD} = \hat{C}_1 + \hat{C}_2 = 120^\circ$ ✓		
	$\widehat{ACD} = y$	corr. $\angle s$ & $AB \parallel CD$ / ooreenkomstige. $\angle e$ & $AB \parallel CD$ ✓	
	$y = 120^\circ$ ✓		
	OR/OF		
	Statement/Bewering	Reason/Rede	1 mark for statement & reason/ 1 punt vir bewering & rede 1 mark for $\hat{C}_1 = 75^\circ$ / 1 punt $\hat{C}_1 = 75^\circ$ 1 mark for $\widehat{ACD} = 120^\circ$ / 1 punt vir $\widehat{ACD} = 120^\circ$ 1 mark for statement & reason/ 1 punt vir bewering & rede 1 mark for answer / 1 punt vir antwoord (5)
	$\hat{C}_1 = 180^\circ - \hat{C}_2 - \hat{A}_2$	co-int. $\angle s$ & $AB \parallel CD$ / ko-binne $\angle e$ & $AB \parallel CD$ ✓	
	$\hat{C}_1 = 180^\circ - 105^\circ = 75^\circ$ ✓		
	$\widehat{ACD} = \hat{C}_1 + \hat{C}_2 = 120^\circ$ ✓		
	$\widehat{ACD} = y$	corr. $\angle s$ & $AB \parallel CD$ / ooreenkomstige. $\angle e$ & $AB \parallel CD$ ✓	
$y = 120^\circ$ ✓			

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2.1.3	Statement/Bewering	Reason/Rede	1 mark for statement/ 1 punt vir bewering (1)
	$\widehat{ACD} = z = 120^\circ \checkmark$	corr. $\angle s$ & $EF \parallel CD$ / ooreenkomstige. $\angle e$ & $EF \parallel CD$	
2.2.1	Statement/Bewering	Reason/Rede	1 mark for reason/ 1 punt vir rede 1 mark for $\widehat{KLN} = 45^\circ$ / 1 punt vir $\widehat{KLN} = 45^\circ$ 1 mark for reason/ 1 punt vir rede 1 mark for substitution/ 1 punt vir vervanging 1 mark for answer/ 1 punt vir antwoord (5)
	$\widehat{KLN} = \widehat{KNL}$	$\angle s$ opp. = sides/ $\angle e$ teenoor = sye $\checkmark$	
	$\therefore \widehat{KLN} = 45^\circ \checkmark$		
	$\widehat{KLN} = \widehat{LNM}$	Alt. $\angle s$ & $KL \parallel NM$ / verw. $\angle e$ & $KL \parallel NM \checkmark$	
	$\therefore \widehat{LNM} = 45^\circ$		
	$45^\circ + 2x + 20^\circ + 3x - 35^\circ = 180^\circ \checkmark$	sum int. $\angle s$ of Δ / som binne $\angle e$ van Δ	
	$5x = 180^\circ - 30^\circ$		
	$5x = 150^\circ$		
	$x = 30^\circ \checkmark$		
2.2.2	Statement/Bewering	Reason/Rede	1 mark for substitution/ 1 punt vir vervanging 1 mark for answer/ 1 punt vir antwoord (2)
	$\widehat{NLM} = 2x + 20^\circ$		
	$\widehat{NLM} = 2(30^\circ) + 20^\circ \checkmark$	$x = 30^\circ$	
	$\widehat{NLM} = 80^\circ \checkmark$		
			[14]

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QUESTION/VRAAG 3

3.1.1	Statement/Bewering	Reason/Rede	1 mark for statement & reason/ 1 punt vir bewering & rede
	$AB = DC$	= sides of square/=sye van vierkant✓	1 mark for statement & reason/ 1 punt vir bewering & rede
	$PB = DR$	opp. sides of $\parallel^m$ /teenoorst. sye van $\parallel^m$ ✓	1 mark for statement & reason/ 1 punt vir bewering & rede
	$\hat{A} = \hat{C} = 90^\circ$	$\angle$ s of a square/ $\angle$ e van vierkant✓	1 mark for statement & reason/ 1 punt vir bewering & rede
	$\therefore \triangle ABP \equiv \triangle CDR$	RHS/ 90° /Hs ✓	1 mark for statement & reason/ 1 punt vir bewering & rede
			(4)
3.2.1	Statement/Bewering	Reason/Rede	1 mark for $\frac{TR}{YZ}$ & 1 mark for $\frac{SR}{XZ}$ / 1 punt vir $\frac{TR}{YZ}$ & 1 punt vir $\frac{SR}{XZ}$
	$\frac{TR}{YZ} \checkmark = \frac{SR}{XZ} \checkmark$		(2)
3.2.2	$\frac{ST}{XY} = \frac{3}{15} = \frac{1}{5} \checkmark$		1 mark for constant ratio $\frac{1}{5}$ / 1 punt vir konstante
	$\frac{TR}{YZ} = \frac{4}{x} = \frac{1}{5} \checkmark$		verhouding $\frac{1}{5}$
	$x = 4 \times 5 = 20 \checkmark$		1 mark for statement & substitution/1 punt vir
	$\frac{SR}{XZ} = \frac{y}{10} = \frac{1}{5} \checkmark$		bewering & vervanging
	$y = \frac{10}{5} = 2 \checkmark$		1 mark for answer/1 punt vir antwoord/ $x = 20$
			1 mark for statement & substitution/1 punt vir
			bewering & vervanging
			1 mark for answer/1 punt vir antwoord/ $y = 2$
			(5)
			[11]

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QUESTION/VRAAG 4

4.1.1	$Area/Oppervlak \Delta MNR = \frac{1}{2} b \times \perp h \checkmark$ $Area/Oppervlak \Delta MNR = \frac{1}{2} 9 \text{ mm} \times 12 \text{ mm} \checkmark$ $Area/Oppervlak \Delta MNR = 54 \text{ mm}^2 \checkmark$	1 mark for formula/ 1 punt vir formule 1 mark for substitution/ 1 punt vervanging 1 mark for answer/ 1 punt vir antwoord (3)
4.1.2	$NM^2 = NR^2 + MR^2 \checkmark$ $NM^2 = (9 \text{ mm})^2 + (12 \text{ mm})^2 \checkmark$ $NM^2 = 81 \text{ mm}^2 + 144 \text{ mm}^2$ $NM^2 = 81 \text{ mm}^2 + 144 \text{ mm}^2$ $NM^2 = 225 \text{ mm}^2$ $NM = 15 \text{ mm} = ST \checkmark$ Perimeter /Omtrek MNST = $2(15 \text{ mm}) + 2(39 \text{ mm}) \checkmark$ Perimeter /Omtrek MNST = $2(15 \text{ mm}) + 2(39 \text{ mm})$ Perimeter /Omtrek MNST = $108 \text{ mm} \checkmark$	1 mark for formula/1 punt vir formule 1 mark for substitution/1 punt vir vervanging 1 mark for answer/1 punt vir antwoord 1 mark for substitution/1 punt vir vervanging 1 mark for answer/1 punt vir antwoord (5)
4.2.1	$V = l \times b \times h \checkmark$ $V = 30 \times 20 \times 10 \checkmark$ $V = 6\,000 \text{ cm}^3 \checkmark$	1 mark for formula/1 punt vir formule 1 mark for substitution/1 punt vir vervanging 1 mark for answer/1 punt vir antwoord (3)
4.2.2	$d = 14 \rightarrow r = 7 \text{ cm} \checkmark$ $V = \pi r^2 \times h \checkmark$ $V = \frac{22}{7} (7)^2 \times 10 \checkmark$ $V = 1540 \text{ cm}^3 \checkmark$ $V = 6\,000 \text{ cm}^3 - 1540 \text{ cm}^3 \checkmark \text{CA}$ $V = 4460 \text{ cm}^3 \checkmark$	1 mark for $r = 7 \text{ cm}$ /1 punt $r = 7 \text{ cm}$ 1 mark for formula/1 punt vir formule 1 mark for substitution/1 punt vervanging 1 mark for answer/1 punt vir antwoord 1 mark for statement/1 punt vir stelling 1 mark for answer/1 punt vir antwoord (6)

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4.2.3	$SA = 2(l + b) \times H + 2 \times l \times b \checkmark$ $SA = 2(30 \text{ cm} + 20 \text{ cm}) \times 10 \text{ cm} + 2 \times 30 \text{ cm} \times 20 \text{ cm} \checkmark$ $SA = 2200 \text{ cm}^2 \checkmark$	1 mark for formula/1 punt vir formule 1 mark for substitution/1 punt vir vervanging 1 mark for answer/1 punt vir antwoord (3)
		[20]
		TOTAL/TOTAAL: 50