



**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/NASIENRIGGLYNE

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 $\hat{A}\hat{C}\hat{D} = 120^\circ$ / 1 punt vir $\hat{A}\hat{C}\hat{D} = 120^\circ$ 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 ✓	
	$\hat{A}\hat{C}\hat{D} = \hat{C}_1 + \hat{C}_2 = 120^\circ$ ✓		
	$\hat{A}\hat{C}\hat{D} = y$	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
	$\hat{C}_1 = 180^\circ - \hat{C}_2 - \hat{A}_2$ $\hat{C}_1 = 180^\circ - 105^\circ = 75^\circ$ ✓	co-int. \angle s & $AB \parallel CD$ / ko-binne \angle e & $AB \parallel CD$ ✓	1 mark for $\hat{C}_1 = 75^\circ$ / 1 punt $\hat{C}_1 = 75^\circ$
	$\hat{A}\hat{C}\hat{D} = \hat{C}_1 + \hat{C}_2 = 120^\circ$ ✓		1 mark for $\hat{A}\hat{C}\hat{D} = 120^\circ$ / 1 punt vir $\hat{A}\hat{C}\hat{D} = 120^\circ$
	$\hat{A}\hat{C}\hat{D} = y$	corr. \angle s & $AB \parallel CD$ / ooreenkomstige. \angle e & $AB \parallel CD$ ✓	1 mark for statement & reason/ 1 punt vir bewering & rede
	$y = 120^\circ$ ✓		1 mark for answer / 1 punt vir antwoord
			(5)

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)
	$\widehat{NLM} = 2x + 20^\circ$		
	$\widehat{NLM} = 2(30^\circ) + 20^\circ \checkmark$	$x = 30^\circ$	
	$\widehat{NLM} = 80^\circ \checkmark$		(2)
			[14]

QUESTION/VRAAG 3

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

QUESTION/VRAAG 4

4.1.1	$\text{Area/Oppervlak } \Delta MNR = \frac{1}{2} b \times \perp h \checkmark$ $\text{Area/Oppervlak } \Delta MNR = \frac{1}{2} 9 \text{ mm} \times 12 \text{ mm} \checkmark$ $\text{Area/Oppervlak } \Delta MNR = 54 \text{ mm}^2 \checkmark$	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	$NM^2 = NR^2 + MR^2 \checkmark$ $NM^2 = (9 \text{ mm})^2 + (12 \text{ mm})^2 \checkmark$ $NM^2 = 81 \text{ mm}^2 + 144 \text{ mm}^2$ $NM^2 = 81 \text{ mm}^2 + 144 \text{ mm}^2$ $NM^2 = 225 \text{ mm}^2$ $NM = 15 \text{ mm} = ST \checkmark$ $\text{Perimeter /Omtrek MNST} = 2(15 \text{ mm}) + 2(39 \text{ mm}) \checkmark$ $\text{Perimeter /Omtrek MNST} = 2(15 \text{ mm}) + 2(39 \text{ mm})$ $\text{Perimeter /Omtrek MNST} = 108 \text{ mm} \checkmark$	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)

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