



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

PROVINSIALE EKSAMEN

NOVEMBER 2021

GRADE/GRAAD 9

MATHEMATICS (PAPER 1)

WISKUNDE (VRAESTEL 1)

MARKING GUIDELINES/*NASIENRIGLYNE*

9 pages/*bladsye*

**MARKING GUIDELINES/
NASIENRIGLYNE**

**MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9**

QUESTION/VRAAG 1

1.1	1.2	1.3	1.4	1.5	
A ✓	D ✓	C ✓	B ✓	C ✓	
					[5]

QUESTION/VRAAG 2

2.1	2.1.1	$-2\frac{1}{3}$; $1,2\bar{3}$; -3 ; $\sqrt{16}$; $2 \checkmark$ A	1 mark for all the rational numbers listed/ <i>1 punt vir al die rasionale getalle gelys</i>	(1)						
	2.1.2	-3 ; $\sqrt{16}$; $2 \checkmark$ A	1 mark for all the integers listed/ <i>1 punt vir al die heelgetalle gelys</i>	(1)						
	2.1.3	$\sqrt{16}$; $2 \checkmark$ A	1 mark for all the whole numbers listed/ <i>1 punt vir al die telgetalle gelys</i>	(1)						
	2.1.4	$\sqrt{16}$; $2 \checkmark$ A	1 mark for all the natural numbers listed/ <i>1 punt vir al die natuurlike getalle gelys</i>	(1)						
	2.1.5	9π ; $\sqrt{20}$ \checkmark A	1 mark for all the irrational numbers listed/ <i>1 punt vir al die irrasionale getalle gelys</i>	(1)						
[5]										
2.2	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">924</td> <td style="text-align: center;">$2^2 \times 3 \times 7 \times 11$</td> </tr> <tr> <td style="text-align: center;">132</td> <td style="text-align: center;">$2^2 \times 3 \times 11$</td> </tr> <tr> <td style="text-align: center;">462</td> <td style="text-align: center;">$2 \times 3 \times 7 \times 11$</td> </tr> </table> <p>$\frac{HCF}{GGD} = 2 \times 3 \times 11 = 66 \checkmark$ A</p> <p>$\frac{LCM}{KGV} = 2^2 \times 3 \times 7 \times 11 = 924 \checkmark$ A</p>		924	$2^2 \times 3 \times 7 \times 11$	132	$2^2 \times 3 \times 11$	462	$2 \times 3 \times 7 \times 11$	1 mark for prime factors of HCF and answer/ <i>1 punt vir priemfaktore van GGD en antwoord.</i> (Award full marks for answer only./ <i>Ken volpunte vir slegs antwoord toe.</i>) 1 mark for prime factors of LCM and answer/ <i>1 punt vir priemfaktore van KGV en antwoord.</i> (Award full mark for answer only/ <i>Ken volpunte vir slegs antwoord toe.</i>)	(2)
924	$2^2 \times 3 \times 7 \times 11$									
132	$2^2 \times 3 \times 11$									
462	$2 \times 3 \times 7 \times 11$									
2.3	<p>$78 - (\text{a certain number}) = 92$ $78 - (\text{'n sekere getal}) = 92$ The certain number = -14 <i>Die sekere getal = $-14 \checkmark$ A</i></p>		1 mark for -14 / <i>1 punt vir -14</i>	(1)						

MARKING GUIDELINES
NASIENRIGLYNE
MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9

2.4	2.4.1	$\frac{195 \times 33 + 195 \times 27}{195 \times 16 - 195 \times 4}$ $= \frac{195(33 + 27)}{195(16 - 4)} \checkmark \mathbf{M}$ $= \frac{60}{12} \checkmark \mathbf{CA}$ $= 5 \checkmark \mathbf{CA}$	1 mark for applying distributive property in numerator and denominator/ <i>1 punt vir toepassing van die distributiewe eienskap op teller en noemer</i> 1 mark for simplification / <i>1 punt vir vereenvoudiging</i> 1 mark for answer <i>1 punt vir antwoord</i> 1 MARK IF LEARNER WROTE ANSWER ONLY. 1 PUNT VIR SLEGS 'n ANTWOORD	(3)
	2.4.2	$-5 - (-3)(4) - (-2)^3$ $= -5 - (-12) - (-8) \checkmark \mathbf{M}$ $= -5 + 12 + 8 \checkmark \mathbf{M}$ $= 15 \checkmark \mathbf{CA}$	1 mark for simplification/ <i>1 punt vir vereenvoudiging</i> 1 mark for multiplication of signs/ <i>1 punt vir vermenigvuldiging van tekens</i> 1 mark for answer/ <i>1 punt vir antwoord</i> 1 MARK IF LEARNER WROTE ANSWER ONLY/ 1 PUNT VIR SLEGS 'n ANTWOORD	(3)
	2.4.3	$\frac{6^2 - (-\sqrt{9})^2 + \sqrt[3]{-27}}{-2^2 \times 1^5 + 1}$ $= \frac{36 - (9) \checkmark \mathbf{M} + (-3) \checkmark \mathbf{M}}{-4 \times 1 + 1 \checkmark \mathbf{M}}$ $= \frac{24}{-3} \checkmark \mathbf{CA}$ $= -8 \checkmark \mathbf{CA}$	1 mark for square root/ <i>1 punt vir vierkantswortel</i> 1 mark for cube root/ <i>1 punt vir derdemagswortel</i> 1 mark for simplification of the denominator/ <i>1 punt vir vereenvoudiging van noemer</i> 1 mark for simplification of numerator and denominator/ <i>1 punt vir vereenvoudiging van teller en noemer</i> 1 mark for answer/ <i>1 punt vir antwoord</i> 1 MARK IF LEARNER WROTE ANSWER ONLY/ 1 PUNT VIR SLEGS 'n ANTWOORD	(5)

MARKING GUIDELINES
NASIENRIGLYNE
MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9

2.5	$\frac{(3x^2y)^2}{(9x^{-3}y^2)^{-1}} \times 3^{-3}$ $= \frac{3^2x^4y^2}{3^{-2}x^3y^{-2}} \checkmark \mathbf{M} \times \frac{1}{3^3} \checkmark \mathbf{M}$ $= 3^{2-(-2+3)}x^{(4-3)}y^{2-(-2)} \checkmark \mathbf{CA}$ $= 3xy^4 \checkmark \mathbf{CA}$ <p>OR/OF</p> $\frac{(3x^2y)^2}{(9x^{-3}y^2)^{-1}} \times 3^{-3}$ $= \frac{9x^4y^2}{9^{-1}x^3y^{-2}} \checkmark \mathbf{M} \times \frac{1}{3^3} \checkmark \mathbf{M}$ $= \frac{9^2x^1y^4}{27} \checkmark \mathbf{CA}$ $= 3xy^4 \checkmark \mathbf{CA}$	<p>1 mark for applying the law $(a \times t)^n = a^n \times t^n$ / <i>1 punt vir toepassing van wet $(a \times t)^n = a^n \times t^n$</i></p> <p>1 mark for applying the law $a^{-m} = \frac{1}{a^m}$ / <i>1 punt vir toepassing van wet $a^{-m} = \frac{1}{a^m}$</i></p> <p>1 mark for applying quotient and product laws / <i>1 punt vir toepassing van kwosiënt en produk wette</i></p> <p>1 mark for simplest final answer / <i>1 punt vir eenvoudigste finale antwoord</i></p>	(4)
			[23]

MARKING GUIDELINES
NASIENRIGLYNE
MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9
QUESTION/VRAAG 3

3.1	3.1.1	1 ; 5 ; 9 ; 13 ✓A	1 mark for all 4 terms/ 1 punt vir al 4 terme	(1)
	3.1.2	There are 25 squares on the 7 th shape. Daar is 25 vierkante in die 7de vorm ✓A	1 mark for 25/ 1 punt vir 25	(1)
	3.1.3	1: $4(1) - 3$ 2: $4(2) - 3$ 3: $4(3) - 3$ $T_n = 4n - 3$ ✓✓A	1 mark for multiplying by 4/ 1 punt vir vermenigvuldiging met 4 1 mark for subtracting 3/ 1 punt vir aftrek van 3	(2)
	3.1.4	$T_n = 4n - 3$ $201 = 4n - 3$ ✓M $201 + 3 = 4n$ $204 = 4n$ $51 = n$ ✓A ∴ the 51 st shape has 201 squares/ ∴ die 51 ^{ste} vorm het 201 vierkante	1 mark for substituting 201/ 1 punt vir vervanging van 201 1 mark for $n = 51$ / 1 punt vir $n = 51$	(2)
3.2	3.2.1		1 mark for correctly representing all information/from the table to the flow diagram/1 punt vir die korrekte weergawe van al die inligting in die tabel na die vloeddiagram	(1)
	3.2.2	$n = -3$ ✓A $m = 17$ ✓A	1 mark for $n = -3$ / 1 punt vir $n = -3$ 1 mark for $m = 17$ / 1 punt vir $m = 17$	(2)
				[9]

MARKING GUIDELINES NASIENRIGLYNE	MATHEMATICS (Paper 1)/ WISKUNDE (Vraestel 1) GRADE/GRAAD 9
---	---

QUESTION/VRAAG 4

4.1	4.1.1	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 10%;">x</td> <td style="width: 10%;">-1</td> <td style="width: 10%;">0</td> <td style="width: 10%;">$\frac{1}{2}$</td> <td style="width: 10%;">1</td> </tr> <tr> <td>y</td> <td>3</td> <td>1 ✓A</td> <td>0</td> <td>-1 ✓A</td> </tr> </table>	x	-1	0	$\frac{1}{2}$	1	y	3	1 ✓A	0	-1 ✓A	1 mark for the first 2 correct values of y/1 punt vir die 1ste 2 korrekte waardes vir y 1 mark for the following 2 correct values of y/1 punt vir die volgende 2 korrekte waardes vir y	(2)
x	-1	0	$\frac{1}{2}$	1										
y	3	1 ✓A	0	-1 ✓A										
	4.1.2	<p style="text-align: center;">✓✓✓CA</p>	1 mark correct shape/ 1 punt vir die korrekte vorm 1 mark for correct x-intercept/ 1 punt vir die korrekte x-afsnit 1 mark for correct y- intercept/ 1 punt vir die korrekte y-afsnit	(3)										
4.2	4.2.1	y-intercept/y-afsnit $y = -4$ ✓A	1 mark for answer/ 1 punt vir antwoord	(1)										
	4.2.2	$\text{gradient/gradient} = \frac{\text{vertical change} / \text{horizontal change}}{\text{vertikale verandering} / \text{horisontale verandering}}$ $m = \frac{1 - (-4) \checkmark \mathbf{M}}{1 - 0 \checkmark \mathbf{M}}$ $m = \frac{5}{1}$ $m = 5 \checkmark \mathbf{CA}$ $m = \frac{\text{vertical change}}{\text{horizontal change}} / \frac{\text{vertikale verandering}}{\text{horisontale verandering}}$ $m = \frac{(-4) - 1 \checkmark \mathbf{M}}{0 - 1 \checkmark \mathbf{M}}$ $m = \frac{-5}{-1}$ $m = 5 \checkmark \mathbf{CA}$	1 mark for vertical change/ 1 punt vir vertikale verandering 1 mark for horizontal change/ 1 punt vir horisontale verandering 1 mark for answer/ 1 punt vir antwoord	(3)										
	4.2.3	$y = 5x - 4$ ✓CA	1 mark for answer/1 punt vir antwoord	(1)										
	4.2.4	Increasing function ✓A Stygende funksie	1 mark for increasing/ 1 punt vir stygende	(1)										
				[11]										

MARKING GUIDELINES
NASIENRIGLYNE
MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9
QUESTION /VRAAG 5

5.1	5.1.1	Coefficient/koëffisiënt ✓A	1 mark for answer/ 1 punt vir antwoord	(1)
	5.1.2	Variable/veranderlike ✓A	1 mark for answer/ 1 punt vir antwoord	(1)
	5.1.3	Constant/konstante ✓A	1 mark for answer/ 1 punt vir antwoord	(1)
	5.1.4	Trinomial/drieterm ✓A	1 mark for answer/ 1 punt vir antwoord	(1)
5.2	5.2.1	$\sqrt{0,09c^6}$ $= 0.3c^3$ ✓A	1 mark for correct answer/ 1 punt vir korrekte antwoord	(1)
	5.2.2	$\frac{(p-1)(p-2)(p-3)}{p+3} \times \frac{p^2-9}{p^2-3p+2}$ $\frac{(p-1)(p-2)(p-3)}{p+3} \times \frac{(p-3)(p+3)}{(p-2)(p-1)}$ ✓✓M $(p-3)(p-3)$ ✓CA	1 mark for each correct factor in the numerator/ 1 punt vir elke korrekte faktor in die teller 1 mark for each correct factor in the denominator/ 1 punt vir elke korrekte faktor in die noemer 1 mark for the answer/ 1 punt vir antwoord	(5)
5.3		$3d^3 - 12d^2 - 15d$ $3d(d^2 - 4d - 5)$ ✓✓M $3d(d-5)(d+1)$ ✓CA	1 mark for each correct factor/ 1 punt vir elke korrekte faktor 1 mark for the answer/ 1 punt vir antwoord	(3)
				[13]

MARKING GUIDELINES
NASIENRIGLYNE
MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9
QUESTION 6/VRAAG 6

6.1	6.1.1	$(x - 3)(x + 4) = 0$ $x - 3 = 0$ or $x + 4 = 0$ ✓ M $x = 3$ ✓ CA or $x = -4$ ✓ CA	1 mark for equating both factors to 0 separately/ <i>1 punt vir aparte gelykstelling van beide faktore aan 0</i> 1 mark for each correct value of x / <i>1 punt vir elke korrekte waarde van x</i>	(3)
	6.1.2	$2^x = 32$ $2^x = 2^5$ ✓ M $x = 5$ ✓ CA	1 mark for 2^5 / <i>1 punt vir 2^5</i> 1 mark for answer/ <i>1 punt vir antwoord</i>	(2)
	6.1.3	$\frac{2x - 2}{3} - \frac{x + 1}{4} = \frac{x - 3}{12}$ $\frac{4(2x - 2) - 3(x + 1)}{12} = \frac{x - 3}{12}$ ✓ M $\frac{8x - 8 - 3x - 3 - x + 3}{12} = 0$ ✓ M $\frac{4x - 8}{12} = 0$ $4x - 8 = 0$ ✓ M $4x = 8$ $x = 2$ ✓ A	1 mark for LCD of 12 <i>1 punt vir KGV = 12</i> 1 mark for simplification/ <i>1 punt vir vereenvoudiging</i> 1 mark for multiplying both sides by 12/ <i>1 punt vir vermenigvuldiging met 12 aan beide kante</i> 1 mark for the answer/ <i>1 punt vir antwoord</i>	(4)

MARKING GUIDELINES
NASIENRIGLYNE
MATHEMATICS (Paper 1)/
WISKUNDE (Vraestel 1)
GRADE/GRAAD 9

6.2	<p>By the time John catches up with Karabo, the distance travelled by each of them will be equal./ <i>John en Karabo sal dieselfde afstand afgelê het teen die tyd wat John vir Karabo ingehaal het.</i> distance = time \times speed/ <i>afstand = tyd \times spoed</i></p> <p>Let John's travelling time be = x/ <i>Laat John se reistyd = x</i> Karabo started travelling an hour before John/ <i>Karabo het 1 uur voor John begin ry</i> \therefore Karabo's travelling time will be = $(x + 1)$ \therefore <i>Karabo se reistyd sal wees = $(x + 1)$</i></p> <p>$\therefore x \times 100 = (x + 1) \times 80$ ✓✓✓M $100x = 80x + 80$ ✓CA $100x - 80x = 80$ $20x = 80$ $x = 4$ ✓CA</p> <p>It will take John 4 hours to catch up with Karabo./ <i>Dit sal John 4 uur vat om Karabo in te haal.</i></p>	<p>1 mark for $x \times 100$/1 punt vir $x \times 100$ 1 mark for $(x + 1) \times 80$/ 1 punt vir $(x + 1) \times 80$</p> <p>1 mark for setting up an equation/1 punt vir opstel van vergelyking</p> <p>1 mark for simplification/ 1 punt vir vereenvoudiging</p> <p>1 mark for answer 1 punt vir antwoord</p>	(5)
			[14]
TOTAL/TOTAAL:			75