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*

QUESTION/*VRAAG* 1

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

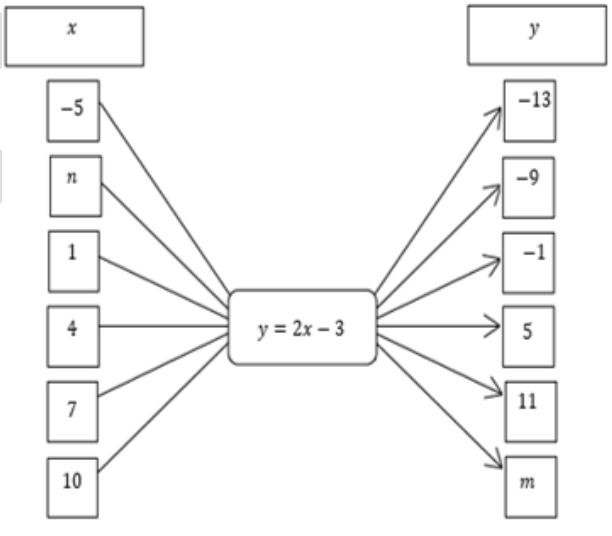
QUESTION/*VRAAG* 2

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

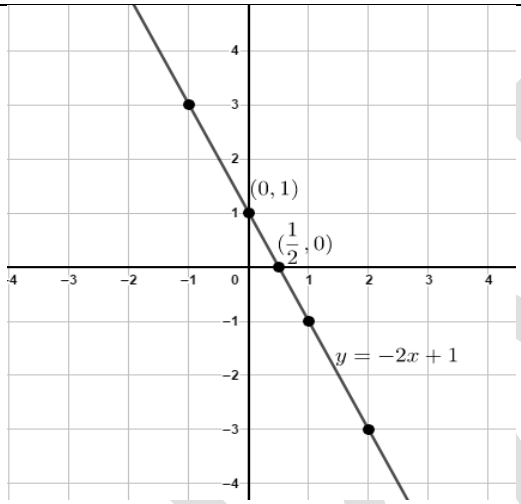
2.4	2.4.1	$\frac{195 \times 33 + 195 \times 27}{195 \times 16 - 195 \times 4}$ $= \frac{195(33+27)}{195(16-4)}$ ✓**M** $= \frac{60}{12}$ ✓**CA** $= 5$ ✓**CA**	1 mark for applying distributive property in numerator and denominator/ *1 punt vir toepassing van die distributiewe eienskap op teller en noemer*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

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

QUESTION/*VRAAG* 3

3.1	3.1.1	1 ; 5 ; 9 ; 13 ✓**A**	1 mark for all 4 terms/ *1 punt vir a1 4 terme*	(1)
	3.1.2	There are 25 squares on the 7th 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 51st shape has 201 squares/** **∴ die 51ste 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	 ✓**A**	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 vloeidiagram*	(1)
	3.2.2	$\boldsymbol{n = -3}$ ✓**A** $\boldsymbol{m = 17}$ ✓**A**	1 mark for $\boldsymbol{n = -3}/$ *1 punt vir* $\boldsymbol{n = -3}$ 1 mark for $\boldsymbol{m = 17}/$ *1 punt vir* $\boldsymbol{m = 17}$	(2)
				[9]

QUESTION/*VRAAG* 4

4.1	4.1.1	<table><tr><td>x</td><td>-1</td><td>0</td><td>$\frac{1}{2}$</td><td>1</td></tr><tr><td>y</td><td>3</td><td>1 ✓**A**</td><td>0</td><td>-1 ✓**A**</td></tr></table>	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)
	4.1.2	 ✓✓✓**CA**	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	gradient/*gradient* = $\frac{vertical\ change}{horizontal\ change}$ / $\frac{vertikale\ verandering}{horisontale\ verandering}$ $m = \frac{1-(-4)}{1-0}$ ✓**M** $m = \frac{5}{1}$ $m = 5$ ✓**CA** $m = \frac{vertical\ change}{horizontal\ change}$ / $\frac{vertikale\ verandering}{horisontale\ verandering}$ $m = \frac{(-4)-1}{0-1}$ ✓**M** $m = \frac{-5}{-1}$ $m = 5$ ✓**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]

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	$\frac{(p-1)(p-2)(p-3)}{p+3} \times \frac{p^2-9}{p^2-3p+2}$ $\frac{(p-1)(p-2)(p-3)}{p+3} \times \frac{(p-3)(p+3)}$ ✓✓**M** $\overline{(p-2)(p-1)}$ ✓✓**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]

QUESTION 6/VRAAG 6

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

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