GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION/

PROVINSIALE EKSAMEN

JUNE/*JUNIE* 2022

GRADE/*GRAAD* 9

MARKING GUIDELINES/

NASIENRIGLYNE

MATHEMATICS/*WISKUNDE*

9 pages/*bladsye*

SECTION/*AFDELING* A

QUESTION/*VRAAG* 1

1.1	1.2	1.3	1.4	1.5
C✓**A**	D✓**A**	D✓ **A**	B✓**A**	A✓**A**

[5]

SECTION/*AFDELING* B

QUESTION/*VRAAG* 2

2.1	2.1.1	15✓**A**	1 mark for the HCF. *1 punt vir die GGF.*	(1)
	2.1.2	300✓**A**	1 mark for the LCM. *1 punt vir die KGV.*	(1)
2.2	$\sqrt[3]{15}$ is between/*tussen* 2 and/*en* 3✓✓**A**		1 mark for the minimum value 2./*1 punt vir die minimum waarde 2.* 1 mark for the maximum value 3./*1 punt vir die maksimum waarde 3.*	(2)
2.3	Irrational/*Irrasionaal*✓**A**		1 mark for the answer. *1 punt vir die antwoord.*	(1)
2.4	Table C/*Tabel C*✓**A** **Possible justification/*Moontlike redes*** $\frac{x}{y} = a\ constant/'n\ konstante$✓✓**A** **OR/*OF*** As the values of x increase, the values of y also increase in the same proportion./*Soos die waardes van x toeneem, neem die waardes van y ook toe in dieselfde verhouding proporsie.* ✓✓**A** **OR/*OF*** As the values of x decrease, the values of y also decrease in the same proportion./*Soos daar 'n afname in die waarde van x is, is daar ook 'n afname in die waarde van y in dieselfde verhouding/proporsie.* ✓✓**A**		1 mark for correct table chosen. *1 punt vir die korrekte tabel gekies.* 2 marks for correct justification. *2 punte vir die korrekte rede.* (Award only 1 mark for justification if learner did not mention "**same proportion**" or any explanation to that effect.) */(Ken slegs 1 punt toe in gevalle waar leerder nie **dieselfde verhouding**/**proporsie** of soortgelyke verduideliking gee nie.)*	(3)

Commented [AN1]:

2.5	Sandile fills $\frac{1}{6}$ of the tank in 1 hour. *Sandile maak* $\frac{1}{6}$ *van die tenk vol in 1 uur.* ✓**M** Jacob fills $\frac{1}{12}$ of the tank in 1 hour *Jacob maak* $\frac{1}{12}$ *van die tenk vol in 1 uur.* ✓**M** Together they fill $\frac{1}{6}+\frac{1}{12}$ of the tank in 1 hour. *Saam maak hulle* $\frac{1}{6}+\frac{1}{12}$ *van die tenk vol in 1 uur.* $\frac{1}{6}+\frac{1}{12}$ $=\frac{2}{12}+\frac{1}{12}$ $=\frac{3}{12}$ $=\frac{1}{4}$ ∴ Together they fill $\frac{1}{4}$ of the tank in 1 hour. ∴ *Saam maak hulle* $\frac{1}{4}$ *van die tenk vol in* 1 *uur.* ✓**A** ∴ It takes them 4 hours to fill the tank working together. ∴ *Saam neem dit hulle* 4 *uur om die tenk vol te maak* ✓**CA**	1 mark for the rate: $\frac{1}{6}$ *of the tank in* 1 *hour* *1 punt vir die koers:* $\frac{1}{6}$ *van die tenk in 1 uur* 1 mark for the rate: $\frac{1}{12}$ *of the tank in* 1 *hour* *1 punt vir die koers:* $\frac{1}{12}$ *van die tenk in 1 uur* 1 mark for adding the rates to get $\frac{1}{4}$. *1 punt vir die som van die koerse* $=\frac{1}{4}$. 1 mark for the answer (4 hours). *1 punt vir die antwoord (4 uur).* **Consider alternative mathematically correct responses which lead to the correct answer.** ***Oorweeg alternatiewe, wiskundig korrekte metodes wat lei na die regte antwoord.***	(4)
			[12]

QUESTION/*VRAAG* 3

3.1	Integers/*Heelgetalle*✓**A**		1 mark for answer. *1 punt vir die antwoord.*	(1)
3.2	**No.** *Nr.*	**Incorrect Statement** *Verkeerde Stelling* / **Correct Statement** *Korrekte Stelling*	1 mark for each correct answer. *1 punt vir elke korrekte antwoord.*	(4)
	3.2.1	$\sqrt[3]{-64} = -8$ / $\sqrt[3]{-64} = -4$✓**A**		
	3.2.2	$-4-(-6) = -10$ / $-4-(-6) = 2$✓**A**		
	3.2.3	$\sqrt{-9} = \pm 3$ / $\sqrt{-9}$ is non-real/ $\sqrt{-9}$ *is nie-reël* ✓**A**		
	3.2.4	$(-5)^2 = -25$ / $(-5)^2 = 25$✓**A**		
3.3	3.3.1	$(5)(-2)^2 - 15 \div 3$ $= 5 \times 4 - 5$✓**M** $= 20 - 5$✓**M** $= 15$✓**CA**	1 mark for squaring and dividing. *1 punt vir kwadraat en deling.* 1 mark for multiplication. *1 punt vir vermenigvuldiging.* 1 mark for answer. *1 punt vir antwoord.*	(3)
	3.3.2	$\frac{2-(-4)-2(1-4)}{1-4}$ $= \frac{2+4-2(-3)}{-3}$✓**M** $= \frac{12}{-3}$✓**M** $= -4$✓**CA**	1 mark for simplifying numerator and denominator. *1 punt vir vereenvoudiging van teller en noemer.* 1 mark for addition and multiplication. *1 punt vir optelling en vermenigvuldiging.* 1 mark for answer. *1 punt vir antwoord.*	(3)
				[11]

QUESTION/*VRAAG* 4

4.1		The exponent tells us how many of the same factors there are in a product of 25. *Die eksponent sê vir ons hoeveel van dieselfde faktore (basis) daar in 'n produk van 25 is.* ✓**A**	1 mark per answer. *1 punt vir antwoord.* Accept any explanation to that effect. *Aanvaar enige soortgelyke antwoord.*	(1)
4.2		7^5✓**A**	1 mark for answer. *1 punt vir antwoord.*	(1)
4.3	4.3.1	$3x^{-2}$ $= \frac{3}{x^2}$ ✓**A**	1 mark for answer. *1 punt vir antwoord.*	(1)
	4.3.2	$\frac{2}{5^{-2}}$ $= 2 \times 5^2$ ✓**A**	1 mark for answer. *1 punt vir antwoord.*	(1)
4.4	4.4.1	$\frac{(-5wz)^2(-2w^2z)}{50w^{-1}z}$ $= \frac{25w^2z^2.-2w^2z}{50w^{-1}z}$✓**M** $= \frac{-50w^4z^3}{50w^{-1}z}$✓**M** $= -w^{4-(-1)}z^{3-1}$✓**M** $= -w^5z^2$✓**CA**	1 mark for raising the product in brackets to the power 2. *1 punt vir verheffing van die produk in hakies tot die 2de mag.* 1 mark for product law application. *1 punt vir toepassing van die produkreël.* 1 mark for quotient law application. *1 punt vir toepassing van die kwosiëntreël.* 1 mark for the answer. *1 punt vir die antwoord.*	(4)

	4.4.2	$\frac{81^{x+1}.5^{2x-2}}{3^{4x}.25^{x}}$ $=\frac{(3^4)^{x+1}.5^{2x-2}}{3^{4x}.(5^2)^{x}}$ ✓**M** $=\frac{3^{4x+4}.5^{2x-2}}{3^{4x}.5^{2x}}$ ✓**M** $=3^{4x+4-4x}.5^{2x-2-2x}$ $=3^4.5^{-2}$ ✓✓**M** $=\frac{81}{25}$ ✓**CA**	1 mark for prime factorising of 81 and 25. *1 punt vir priemfaktorisering van 81 en 25.* 1 mark for multiplying a power with a power in numerator and denominator. *1 punt vir vermenigvuldiging van 'n mag met 'n mag in die teller en noemer.* 1 mark for application of quotient rule for each base. *1 punt vir toepassing van die kwosiëntreël vir elke basis.* 1 mark for the answer. *1 punt vir die antwoord.*	(5)
				[13]

QUESTION/*VRAAG* 5

5.1	5.1.1	**Position of diagram** ***Posisie van diagram*** | **1** | **2** | **3** | **4** | **5** **Number of points of intersection** ***Aantal snypunte*** | **3** | **12** | **27** | 48✓**A** | 75✓**A**	1 mark per answer. *1 punt per antwoord.*	(2)
	5.1.2	The position is squared and thereafter multiplied by three. *Die posisie word gekwadreer en daarna met drie vermenigvuldig.* ✓✓**A**	2 marks for answer. *2 punte vir antwoord.* **Consider alternative responses which mean the same.** ***Oorweeg alternatiewe verduidelikings met dieselfde betekenis.***	(2)
5.2	Pattern of fifth row: 25; 31; 37 ... *Patroon vir 5de ry: 25; 31; 37 ...* $T_1: 6(1) + \_\_\_\_\_ = 25$ $T_1: 6(1) + \mathbf{19} = 25$ $T_2: 6(2) + \_\_\_\_\_ = 31$ $T_2: 6(2) + \mathbf{19} = 31$ $T_3: 6(3) + \_\_\_\_\_ = 37$ $T_3: 6(3) + \mathbf{19} = 37$ $\therefore T_n = 6n + 19$✓✓**A** $T_{100} = 6(100) + 19$ $= 600 + 19$ $= 619$✓**A**	1 mark for 6*n*. *1 punt vir 6n.* 1 mark for 19. *1 punt vir 19.* 1 mark for 619. *1 punt vir 619.*	(3)
				[7]

QUESTION/*VRAAG* 6

6.1	Binomial/*Binomiaal/Twee-term* ✓**A**		1 mark for answer. *1 punt vir antwoord.*	(1)
6.2	variables/*veranderlikes*✓**A** **OR/*OF*** unknowns/*onbekendes*		1 mark for answer. *1 punt vir antwoord.*	(1)
6.3	6.3.1	$\sqrt{9x^4y^2}$ $= 3x^2y$✓**A**	1 mark for answer. *1 punt vir antwoord.*	(1)
	6.3.2	$(x+5)(x-3)$ $= x^2 - 3x + 5x - 15$ ✓✓**M** $= x^2 + 2x - 15$✓**CA**	1 mark for $x^2 - 3x$. *1 punt vir* $x^2 - 3x$. 1 mark for $5x - 15$. *1 punt vir* $5x - 15$. 1 mark for continuous accuracy **CA**. *1 punt vir deurlopende akkuraatheid* ***"CA"***.	(3)
	6.3.3	$\frac{25z^2 - 9}{5z + 3}$ $= \frac{(5z-3)(5z+3)}{5z+3}$✓✓**M** $= 5z - 3$✓**CA**	1 mark for each factor. *1 punt vir elke faktor.* $(5z - 3)(5z + 3)$. 1 mark for answer. *1 punt vir antwoord.*	(3)
6.4	6.4.1	$3x(q-r) - 2(q-r)$ $= (q-r)(3x-2)$ ✓**A**	1 mark for correct answer. *1 punt vir korrekte antwoord.*	(1)
	6.4.2	$2x^3 - 10x^2 - 28x$ $= 2x(x^2 - 5x - 14)$✓**M** $= 2x(x+2)(x-7)$ ✓✓**CA**	1 mark for common factor $2x$. *1 punt vir GGF* $2x$. 1 mark for each factor $(x+2)(x-7)$. *1 punt vir elke faktor* $(x+2)(x-7)$.	(3)
				[13]

QUESTION/*VRAAG* 7

7.1	Five subtracted from a number then the answer multiplied by three to give an answer of 16**.** *Vyf afgetrek van 'n sekere getal en die antwoord vermenigvuldig met drie om 'n antwoord van 16 te gee.* ✓**A**		1 mark for answer. *1 punt vir antwoord.* **Consider alternative responses which mean the same.** ***Oorweeg alternatiewe antwoorde met dieselfde betekenis.***	(1)
7.2	$2\left(\frac{1}{2}x+4\right)-1=13$✓**A**		1 mark for answer. *1 punt vir antwoord.*	(1)
7.3	7.3.1	$0{,}3x-2{,}1=0{,}7-0{,}4x$ $0{,}3x+0{,}4x=0{,}7+2{,}1$ $0{,}7x=2{,}8$✓**M** $x=4$✓**CA**	1 mark for $0{,}7x=2{,}8$. *1 punt vir* $0{,}7x=2{,}8$. 1 mark for answer. *1 punt vir antwoord.*	(2)
	7.3.2	$9^{x+1}=\frac{1}{27}$ $3^{2x+2}=3^{-3}$✓**M** $\therefore 2x+2=-3$✓**M** $x=\frac{-5}{2}$✓**CA** **OR/*OF*** $x=-2\frac{1}{2}$✓**CA**	1 mark for prime factorisation of bases. *1 punt vir priemfaktorisering van basisse.* 1 mark for equating the exponents. *1 punt vir gelykstelling van eksponente.* 1 mark for answer. *1 punt vir antwoord.*	(3)
	7.3.3	$\frac{5x-7}{3}-\frac{7x-10}{5}=1$ $\frac{15(5x-7)}{3}-\frac{15(7x-10)}{5}=15$✓**M** $5(5x-7)-3(7x-10)=15$ $25x-35-21x+30=15$✓**M** $4x=15+35-30$ $4x=20$ $x=5$✓**CA**	1 mark for multiplying all terms by 15. *1 punt vir vermenigvuldiging van alle terme met 15.* 1 mark for simplification. *1 punt vir vereenvoudiging.* 1 mark for answer. *1 punt vir antwoord.*	(3)
7.4	$x^2+2x=3$✓**A** $x^2+2x-3=0$ $(x-1)(x+3)=0$✓**M** $x=1$ *or* $x=-3$✓ ✓**CA**		1 mark for setting up correct equation. *1 punt vir opstel van 'n korrekte vergelyking.* 1 mark for correct factors. *1 punt vir korrekte faktore.* 1 mark per answer. *1 punt per antwoord.*	(4)
				[14]
			TOTAL/*TOTAAL*	**75**