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**PROVINCIAL EXAMINATION/
PROVINSIALE EKSAMEN
JUNE/*JUNIE* 2022
GRADE/*GRAAD* 9
MARKING GUIDELINES/
*NASIENRIGLYNE***

MATHEMATICS/*WISKUNDE*

9 pages/*bladsye*

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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]:

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2.5	Sandile fills $\frac{1}{6}$ of the tank in 1 hour. <i>Sandile maak $\frac{1}{6}$ van die tenk vol in 1 uur. ✓M</i> Jacob fills $\frac{1}{12}$ of the tank in 1 hour <i>Jacob maak $\frac{1}{12}$ van die tenk vol in 1 uur. ✓M</i> Together they fill $\frac{1}{6} + \frac{1}{12}$ of the tank in 1 hour. <i>Saam maak hulle $\frac{1}{6} + \frac{1}{12}$ van die tenk vol in 1 uur.</i> $\frac{1}{6} + \frac{1}{12}$ $= \frac{2}{12} + \frac{1}{12}$ $= \frac{3}{12}$ $= \frac{1}{4}$ ∴ Together they fill $\frac{1}{4}$ of the tank in 1 hour. ∴ <i>Saam maak hulle $\frac{1}{4}$ van die tenk vol in 1 uur. ✓A</i> ∴ It takes them 4 hours to fill the tank working together. ∴ <i>Saam neem dit hulle 4 uur om die tenk vol te maak ✓CA</i>	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. <i>Oorweeg alternatiewe, wiskundig korrekte metodes wat lei na die regte antwoord.</i>	(4)
			[12]

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QUESTION/VRAAG 3

3.1	Integers/Heelgetalle✓A		1 mark for answer. 1 punt vir die antwoord.	(1)														
3.2	<table><tr><th>No. Nr.</th><th>Incorrect Statement Verkeerde Stelling</th><th>Correct Statement Korrekte Stelling</th></tr><tr><td>3.2.1</td><td>$\sqrt[3]{-64} = -8$</td><td>$\sqrt[3]{-64} = -4$✓A</td></tr><tr><td>3.2.2</td><td>$-4 - (-6) = -10$</td><td>$-4 - (-6) = 2$✓A</td></tr><tr><td>3.2.3</td><td>$\sqrt{-9} = \pm 3$</td><td>$\sqrt{-9}$ is non-real/ $\sqrt{-9}$ is nie-reël ✓A</td></tr><tr><td>3.2.4</td><td>$(-5)^2 = -25$</td><td>$(-5)^2 = 25$✓A</td></tr></table>	No. Nr.	Incorrect Statement Verkeerde Stelling	Correct Statement Korrekte Stelling	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	1 mark for each correct answer. 1 punt vir elke korrekte antwoord.	(4)
No. Nr.	Incorrect Statement Verkeerde Stelling	Correct Statement Korrekte Stelling																
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]														

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QUESTION/VRAAG 4

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

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

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QUESTION/VRAAG 5

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

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QUESTION/VRAAG 6

6.1	Binomial/Binomiaal/Twee-term ✓A	1 mark for answer. 1 punt vir antwoord.	(1)
6.2	variables/veranderlikes ✓A unknowns/onbekendes OR/OF	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]			

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QUESTION/VRAAG 7

7.1	Five subtracted from a number then the answer multiplied by three to give an answer of 16. <i>Vyf afgetrek van 'n sekere getal en die antwoord vermenigvuldig met drie om 'n antwoord van 16 te gee. ✓A</i>	1 mark for answer. <i>1 punt vir antwoord.</i> Consider alternative responses which mean the same. <i>Oorweeg alternatiewe antwoorde met dieselfde betekenis.</i>	(1)
7.2	$2\left(\frac{1}{2}x + 4\right) - 1 = 13$ ✓A	1 mark for answer. <i>1 punt vir antwoord.</i>	(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 $0,7x = 2,8$. <i>1 punt vir $0,7x = 2,8$.</i> 1 mark for answer. <i>1 punt vir antwoord.</i>	(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. <i>1 punt vir priemfaktoriserings van basisse.</i> 1 mark for equating the exponents. <i>1 punt vir gelykstelling van eksponente.</i> 1 mark for answer. <i>1 punt vir antwoord.</i>	(3)
	7.3.3 $\frac{5x-7}{3} - \frac{7x-10}{5} = 1$ $\frac{15(5x-7)}{15} - \frac{15(7x-10)}{15} = 15$ ✓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. <i>1 punt vir vermenigvuldiging van alle terme met 15.</i> 1 mark for simplification. <i>1 punt vir vereenvoudiging.</i> 1 mark for answer. <i>1 punt vir antwoord.</i>	(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. <i>1 punt vir opstel van 'n korrekte vergelyking.</i> 1 mark for correct factors. <i>1 punt vir korrekte faktore.</i> 1 mark per answer. <i>1 punt per antwoord.</i>	(4)
			[14]
		TOTAL/TOTAAL	75