Education and Sport Development

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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 10

TECHNICAL MATHEMATICS P1
JUNE 2019

MEMORANDUM

MARKS: 75

This memorandum consists of 6 pages.

QUESTION/VRAAG 1

1.1.1	$\sqrt{27}$	✓ one mark /een punt (1)
1.1.2	$\sqrt{-27}$	✓answer/antwoord (1)
1.1.3	$\sqrt[3]{-27}$	✓answer/antwoord (1)
1.2	Let/laat $x = 0,\dot{2}\dot{3}$ ----------1 $100x = 23,\dot{2}\dot{3}$ ----------2 $100x - x = 23$ $99x = 23$ $x = \frac{23}{99}$	✓equating to x/stel gelyk aan x ✓multiply by 100/vermenigvuldig met100 ✓answer/antwoord (3)
1.3	5 and/en 6 OR/OF $5 < \sqrt{27} < 6$	✓✓both values/beide waardes (2)
1.4	$55_{10} = 32 + 16 + 4 + 2 + 1$ $= 2^5 + 2^4 + 2^2 + 2^1 + 2^0$ $= (2^5 \times 1) + (2^4 \times 1) + (2^3 \times 0) + (2^2 \times 1) + (2^1 \times 1) + (2^0 \times 1)$ $= 110111_2$ OR/OF 2 | 55 | 1 2 | 27 | 1 2 | 13 | 1 2 | 6 | 0 2 | 3 | 1 2 | 1 | 1 $55_{10} = 110111_2$	✓method/metode ✓answer/antwoord (2)
1.5.1	1 0 1 1 0 × 1 0 1 1 0 1 1 0 1 0 1 1 0 0 0 1 1 0 1 1 1 0	✓first row 10110/eerste ry 10110 ✓2nd row 1011000/tweede ry 1011000 ✓answer/antwoord (3)
1.5.2	1 1 0 1 1 1 0 $= (2^6 \times 1) + (2^5 \times 1) + (2^4 \times 0) + (2^3 \times 1) + (2^2 \times 1) + (2^1 \times 1) + (2^0 \times 0)$ = 64+32+8+4+2	✓method/metode

	$= 110$	✓answer/antwoord (2)
1.6	$A = b^{a-1} + a^{b+1}$ $= (3)^{2-1} + (2)^{3+1}$ $= 3 + 16$ $\therefore A = 19$	✓substitution/substitusie ✓simplify/vereenvoudig ✓answer/antwoord (3)
1.7	$1 \times 10^{-6} = 0{,}000001$	✓answer/antwoord (1)

[19]

QUESTION 2/VRAAG 2

2.1.1	$(5x-1)(x+2)-2$ $= 5x^2 + 9x - 2 - 2$ $= 5x^2 + 9x - 4$	✓expanding/uitbreiding ✓final answer/finale antwoord (2)
2.1.2	$-7x(x-4)^2$ $= -7x(x^2 - 8x + 16)$ $= -7x^3 + 56x^2 - 112x$	✓✓expanding brackets/uitmaal van hakies ✓answer/antwoord (3)
2.2	$(x+3)^2 = x^2 + 6x + 9$ $\therefore x^2 + 6x + 9 - (x^2 - x + 9)$ $= x^2 + 6x + 9 - x^2 + x - 9$ $= 7x$ $\therefore 7x$	✓ $x^2 + 6x + 9$ ✓subtracition/aftrekking ✓answer/antwoord or/of ✓answer only/antwoord alleenlik (3)
2.3.1	$4x^3 - 12x^2 + 16x$ $= 4x(x^2 - 3x + 4)$ $= 4x(x-4)(x+1)$	✓4x as common factor/4x as gemeenskaplike factor ✓✓both brackets/beide hakies (3)
2.3.2	$a^3 - 3a^2 - 4a + 12$ $= a^2(a-3) - 4(a-3)$ $= (a-3)(a^2 - 4)$ $= (a-3)(a-2)(a+2)$	✓grouping/groepering ✓common factor/gemeenskaplike factor ✓✓difference of squares/verskil van vierkante (4)

2.4	$\frac{x^2-x-12}{x^2-9} \div \frac{2x-8}{3x-9}$ $= \frac{x^2-x-12}{x^2-9} \times \frac{3x-9}{2x-8}$ $= \frac{(x-4)(x+3)}{(x-3)(x+3)} \times \frac{3(x-3)}{2(x-4)}$ $= \frac{3}{2}$	✓$\times \frac{3x-9}{2x-8}$ ✓✓factors numerator and denominator in1st fraction/faktore teller en noemer in eerste breuk ✓one mark second fraction factors/een punt tweede breuk faktore ✓answer/antwoord (5)
2.5	$\sqrt{(x^2-2xy+y^2)}$ $= \sqrt{(x-y)^2}$ $= x-y$	✓$(x-y)^2$ ✓answer/antwoord (2)

[22]

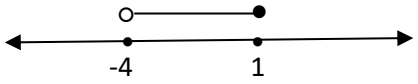
QUESTION 3/VRAAG 3

3.1	$2(a^2b^3)^{-2}$ $= 2(a^{-4}b^{-6})$ $= \frac{2}{a^4b^6}$	✓raising power/magsverheffing ✓numerator/teller ✓denominator/noemer (3)
3.2	$\frac{5a(2a^3)^2}{-25a^4+5a^4}$ $= \frac{20a^7}{-20a^4}$ $= -a^3$	✓numerator/teller ✓denominator/noemer ✓answer/antwoord (3)
3.3	$\sqrt[3]{216x^3} - 16x$ $= 6x - 16x$ $= -10x$	✓$6x$ ✓answer/antwoord (2)
3.4	$\frac{8^{x+1}}{4^{2x-2}}$ $= \frac{(2^3)^{x+1}}{(2^2)^{2x-2}}$ $= \frac{2^{3x+3}}{2^{4x-4}}$ $= 2^{7-x}$	✓✓prime bases/priem grondtalle ✓simplify/vereenvoudig ✓answer/antwoord (4)

[12]

QUESTION 4/VRAAG 4

4.1.1	$5.2^x = 160$ $2^x = 32$ $2^x = 2^5$ $\therefore x = 5$	✓$\div 5$ ✓prime bases/priem grontalle ✓answer/antwoord (3)
4.1.2	$x^2 - 4x = 0$ $x(x-4) = 0$ $\therefore x = 0$ *or / of* $x = 4$	✓factors/faktore ✓both answers/beide antwoorde (2)
4.1.3	$\frac{x+7}{4} = \frac{1}{2}$ $x + 7 = 2$ $x = -5$	✓multiply with LCM 4/vermenigvuldig met KGV 4 ✓answer/antwoord (2)
4.1.4	$(x+2)(x-3) = 6$ $x^2 - x - 6 = 6$ $x^2 - x - 12 = 0$ $(x-4)(x+3) = 0$ $\therefore x = 4$ *or / of* $x = -3$	✓standard form/standard vorm ✓factors/faktore ✓✓1x each answer/1x elke antwoord (4)

4.2.1	$-3 < 2x + 5 \leq 7$ $-3 - 5 < 2x \leq 7 - 5$ $-8 < 2x \leq 2$ $\therefore -4 < x \leq 1$	✓-5 on all sides/aan alle kante ✓÷ 2 ✓✓each endpoint/elke eindpunt (4)
4.2.2		✓✓2 marks/2 punte (2)
4.3	$V = u + at$ $V - u = at$ $\frac{V-u}{t} = a$	✓subtract u/aftrekking van u ✓÷ t (2)
4.4	$x + y = 7 - - - - - 1$ $2x + y = 11 - - - - 2$ $2 - 1:$ $\therefore x = 4$ $\therefore y = 3$ or/of $x + y = 1 - - - - - - - - - - 1$ $2x + y = 11 - - - - - - - - - 2$ From/vanuit 1: $y = 7 - x - - - - 3$ Substitute/stel 3 in 2: $2x + (7 - x) = 11$ $\therefore x = 4$ $\therefore y = 3$	✓subract 1 from 2/trek 1 van 2 af/or substitution/ of vervanging ✓x value/x waarde ✓y value/y waarde (3)

[22]

TOTAL/TOTAAL:75