Education and Sport Development

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NORTH WEST PROVINCE

GRADE/GRAAD 11

MATHEMATICS P1/WISKUNDE V1 MEMORANDUM

MID –YEAR EXAMINATION 2018/
HALF-JAAR EKSAMEN 2018

MARKS: 100
PUNTE: 100

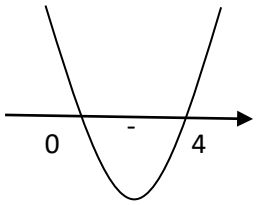
NW/JUNE/MATH/ EMIS/6*******

This memorandum consists of 8 pages.

Hierdie memorandum bestaan uit 8 blabsye.

QUESTION/VRAAG 1

1.1.1	$(3x-1)(x+3)=0$ $x=\frac{1}{3}$ or/of $x=-3$	✓ Equating to 0 / Gelykstelling aan 0 ✓ Both Answers / Beide antwoorde (2)
1.1.2.	$(3x-1)(x+3)=-5$ $3x^2+8x+2=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $x=\frac{-(8)\pm\sqrt{(8)^2-4(3)(2)}}{2(3)}$ $x=\frac{-8\pm\sqrt{40}}{6}$ $x=-0,28$ or/of $x=-2,39$	✓$3x^2+8x+2=0$ ✓ formula/formule ✓sub. into correct formula/ invervanging in korrekte formule ✓ $x=\frac{-8\pm\sqrt{40}}{6}$ ✓answers/antwoorde (5)
1.2.1	$\sqrt{x+2}+x=4$ $\sqrt{x+2}=4-x$ $x+2=16-8x+x^2$ $x^2-9x+14=0$ $(x-7)(x-2)=0$ $x=7$ N/A/ N.V.T or/of $x=2$	✓ $\sqrt{1+x}=4-x$ ✓ squaring/kwadrering ✓standard form/standaard vorm ✓factors/faktore ✓answer/antwoord (5)
1.2.2	$4(x^2-x)-\frac{2}{x^2-x}=7$ Let/Laat $x^2-x=k$ $4k-\frac{2}{k}=7$ $4k^2-7k-2=0$ $(4k+1)(k-2)=0$	✓ x^2 -$x=k$ ✓std form in k /stdvorm in k ✓factors/faktore ✓vales of *k*/waardes van *k*

	$k = -\frac{1}{4}$ or / of $k = 2$ $x^2 - x = -\frac{1}{4}$ or / of $x^2 - x = 2$ $4x^2 - 4x + 1 = 0$ or/of $x^2 - x - 2 = 0$ $(2x - 1)(2x - 1) = 0$ or/of $(x - 2)(x + 1) = 0$ $x = \frac{1}{2}$ or / of $x = 2$ or / of $x = -1$	✓ 2 eqs. in x/2 vgl's in x ✓✓ 3 values of x/ 3 waardes van x (7)
1.2.3	$3^{x-2} + 3^{x+1} = 28$ $3^x\left(3^{-2} + 3^1\right) = 28$ $3^x\left(\frac{28}{9}\right) = 28$ $3^x = 9$ $3^x = 3^2$ $x = 2$	✓ taking CF outside/ faktorisering van GF ✓ simplification/ vereenvoudiging ✓$3^x = 9$ ✓ answer/antwoord (4)
1.2.4	$x^2 \leq 4x$ $x^2 - 4x \leq 0$ $x(x-4) \leq 0$ $0 \leq x \leq 4$ 	✓ $x^2 - 4x \leq 0$ ✓ factors/faktore ✓end values/kritieke waardes ✓notation/notasie (4)
1.3	$x - 3 - y = 0$ and/en $xy = -2$ $x = y + 3$ $(y + 3)y = -2$ $y^2 + 3y + 2 = 0$ $(y + 2)(y + 1) = 0$ $y = -2$ or/of $y = -1$ $x = -2 + 3 = 1$ or/of $x = -1 + 3 = 2$	✓ $x = y + 3$ ✓sub. of/inverv van x ✓std form/std vorm ✓factors/faktore ✓ y values/y-waardes ✓✓x values/x-waardes (7)

QUESTION/VRAAG 2

2.1	$x = 3 \pm \sqrt{18 - 2a^2}$ For equal roots/Vir gelyke wortels, $\Delta = 0$ $18 - 2a^2 = 0$ $a^2 = 9$ $a = \pm 3$	✓ $\Delta = 0$ ✓ $18 - 2a^2 = 0$ ✓ $a = \pm 3$ (3)
2.2.1	$(a + 3)^2 + 12$ $(a + 3)^2$ is always positive /is altyd positief $(a + 3)^2 + 12$ will also positive/sal altyd positief wees Roots are real / Wortels is reëel	✓ $\Delta \geq 0$ ✓ Roots are real/ Wortels is reëel (2)
2.2.3	$-4(a - b)^2 < 0$ Roots are non-real / Wortels in nie-reëel	✓ $-4(a - b)^2 < 0$ ✓ Roots are non-real / Wortels is nie-reëel (2) NB: Accept Irrational/ Aanvaar Irrasionaal

QUESTION/VRAAG 3

3.1.1	$\sqrt[4]{\frac{3^a \cdot 9^{a+1}}{27^{a+2}}} = \sqrt[4]{\frac{3^a \cdot 3^{2(a+1)}}{3^{3(a+2)}}}$ $= \sqrt[4]{3^{3a+2-3a-6}}$ $= \sqrt[4]{3^{-4}}$ $= \frac{1}{3}$	✓ $\sqrt[4]{\frac{3^a \cdot 3^{2(a+1)}}{3^{3(a+2)}}}$ ✓ $\sqrt[4]{3^{3a+2-3a-6}}$ ✓answer / antwoord (3)
3.1.2	$\frac{2^{x+3} - 3.2^{x-1}}{2^{x-2}} = \frac{2^x(8 - 3.2^{-1})}{2^x \cdot 2^{-2}}$ $= \frac{8 - \frac{3}{2}}{\frac{1}{4}}$ $= 26$	✓taking common factor outside / faktorisering gemeensk faktor ✓ $\frac{8 - \frac{3}{2}}{\frac{1}{4}}$ ✓answer/antwoord (3)

3.2	$10^{x+3} = 10^x \cdot 10^3$ $= 1{,}7 \times 1000$ $= 1700$	✓$10^x \cdot 10^3$ ✓answer/antwoord (2)
3.3	$2.9^a + 3.2^{-b} = 2.3^{2a} + 3.2^{-b}$ $= 2.(p)^2 + 3.(q)^{-1}$ $= 2p^2 + \frac{3}{q}$	✓ 3^{2a} ✓ sub of p and q./ Invervanging van p en q ✓$2p^2 + \frac{3}{q}$ (3)

QUESTON/VRAAG 4

4.1	4 ; 9 ; x ; 37 5 $x - 9$ $37 - x$ $x - 14$ $46 - 2x$ $x - 14 = 46 - 2x$ $x = 20$	✓ correct first differences/ korrekte eerste verskille ✓ second differences / tweede verskille ✓answer / antwoord (3)
4.2	$2a = 6$ $a = 3$ $3a + b = 5$ $3 \cdot 3 + b = 5$ $b = -4$ $a + b + c = 4$ $3 + (-4) + c = 4$ $c = 5$ $T_n = an^2 + bn + c$ $= 3n - 4n + 5$	✓ value of/waarde van a ✓value of/waarde van b ✓value of/waarde van c ✓ answer/antwoord (4)
4.3	$3n^2 - 4n + 5 = 212$ $3n^2 - 4n - 207 = 0$ $n = \frac{4 \pm \sqrt{16 - 4(3)(-207)}}{6}$ $= 9$ or / of $\frac{-23}{3}$ n = 9	✓ equating to 212 / gelykstelling aan 212 ✓ standard form/std vorm ✓ values of/waardes van n ✓ answer/antwoord (4)

QUESTION/VRAAG 5

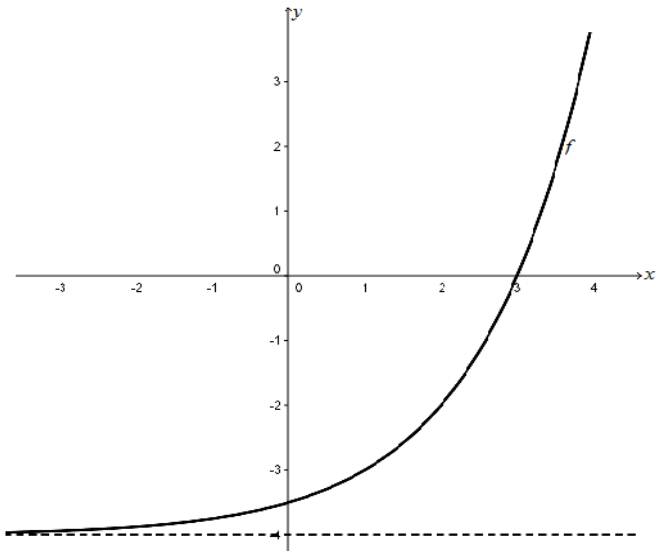
5.1.1	$i_{eff} = \left(1 + \frac{i}{m}\right)^{m} - 1$ $= \left(1 + \frac{0{,}075}{12}\right)^{12} - 1$ $= 0{,}07763259...$ Rate/Koers = 7,76%	✓ formula/formule ✓correct sub. into formula/ korrekte inverv. in formule ✓answer /antwoord (3)
5.1.2	$A = P(1+i)^n$ $= 120000\left(1 + \frac{0{,}075}{12}\right)^{4\times 12}$ = R 161831,90	✓formula/formule ✓sub. into the formula/ inverv. in formule ✓answer/antwoord (3)
5.2	$A = P(1-i)^n$ $= 80000(1-0{,}12)^3$ = R54517,76	✓formula/formule ✓sub. into the formula/ inverv. in formule ✓answer/antwoord (3)
5.3	$x(1+\frac{0{,}12}{4})^{12}(1+\frac{0{,}14}{6})^{4} = 95000$ $x\left(1+\frac{0{,}12}{4}\right)^{12}\left(1+\frac{0{,}14}{2}\right)^{4} = 95000$ $x(1{,}868881682) = 95000$ $x = R5083{,}54$	✓$\left(1+\frac{0{,}12}{4}\right)^{12}$ ✓$\left(1+\frac{0{,}14}{2}\right)^{4}$ ✓ equating to/gelykstelling aan 95000 ✓ 1,868881682 ✓answer/antwoord (5)

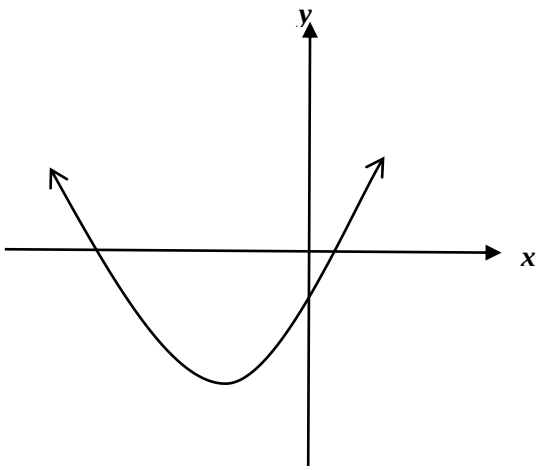
QUESTION/VRAAG 6

6.1	$g(x) = \frac{a}{x-2} + 6$ $0 = \frac{a}{\frac{5}{2}-2} + 6$ $a = -3$	✓ value of/waarde van p ✓ value of/waarde van q ✓ value of/waarde van a ✓ equation/vergelyking (4)

	$g(x)=\frac{-3}{x-2}+6$	
6.2	$x \in R, \quad x \neq 2$	✓ answer/antwoord (1)
6.3	$2 < x \leq \frac{5}{2}$	✓ end points/kritieke waardes ✓ correct notation/korrekte notasie (2)
6.4	$F\left(\frac{3}{2}\ ;\ 12\right)$	✓x coordinate/koördinaat ✓y coordinate/koördinaat (2)

QUESTION/VRAAG 7

7.1.1	$y = -4$	✓ $y = -4$
7.1.2	$f(x)=2^{x-1}-4$ $0 = 2^{x-1}-4$ $2^{x-1} = 2^2$ $x = 3$ $(3\ ;0)$	✓making/maak $y = 0$ ✓ 2^2 ✓ $x = 3$ (3)
7.1.3	y- intercept /y-afsnit $y = y = 2^{0-1}-4 = \frac{-7}{2}$ 	✓y-int/y-afsnit ✓x-int/x-afsnit ✓ shape(increasing)/ vorm(stygend) ✓ asymptote / asimptote (4)

7.1.4	Range/Waardeversameling is $y > -4$	✓answer/antwoord (1)
7.1.5	$m = 2^{1-1} - 4 = -3$	✓answer/antwoord (1)
7.2		✓shape(concave up)/ vorm(konkaaf op) ✓ x-intercepts (one +ve and one –ve)/ *x*-afsnitte (een +tiewe en een -tiewe) ✓ -ve *y*-intercept/ -tiewe *y*-afsnit ✓-ve axis of symmetry / -tiewe simmetrie-as (4)