



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE /
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/ GRAAD 11

NOVEMBER 2020

**TECHNICAL MATHEMATICS P1 / *TEGNIESE WISKUNDE V1*
MARKING GUIDELINES / *NASIENRIGLYNE*
(EXEMPLAR/*EKSEMPLAAR*)**

MARKS / PUNTE: 150

MARKING CODES / <i>NASIENKODES</i>	
A	Accuracy / <i>Akkuraatheid</i>
CA	Consistent Accuracy / <i>Deurlopende akkuraatheid</i>
M	Method / <i>Metode</i>
R	Rounding / <i>Afronding</i>
NPR	No penalty for rounding / <i>Geen penalisering vir afronding</i>
NPU	No penalty for units omitted / <i>Geen penalisering vir eenhede uitgelaat</i>
S	Simplification / <i>Vereenvoudiging</i>
SF	Substitution in the correct formula / <i>Korrekte vervanging in die korrekte formule</i>
AO	Answer only / <i>Slegs antwoord</i>

This marking guide consists of 15 pages. /
Hierdie nasienriglyn bestaan uit 15 bladsye.

QUESTION / VRAAG 1					
1.1	1.1.1	$\left(3pq^{\frac{1}{2}}\right)^2$ $= 3^2 p^2 q$ $= 9p^2 q$	✓ Exponential property / <i>Eksponensiaal eienskap</i> ✓ Simplification / <i>Vereenvoudiging</i>	(2)	
	1.1.2	$\sqrt[6]{64p^{12}q^6} + \sqrt[3]{8p^6q^3}$ $= \sqrt[6]{2^6 p^{12} q^6} + \sqrt[3]{2^3 p^6 q^3}$ $= (2^6 p^{12} q^6)^{\frac{1}{6}} + (2^3 p^6 q^3)^{\frac{1}{3}}$ $= 2p^2 q + 2p^2 q$ $= 4p^2 q$	✓ Prime factors / <i>Priemfaktore</i> ✓ Exponential form / <i>Eksponensiaal vorm</i> ✓ Simplification / <i>Vereenvoudiging</i> ✓ Simplification / <i>Vereenvoudiging</i>	A CA CA CA	(4)
	1.1.3	$\frac{(4^{-1})^3 \cdot 2^{3n-2}}{4^{3n+2} \cdot \left(\frac{1}{8}\right)^{n+3}}$ $= \frac{(2^{-2})^3 \cdot 2^{3n-2}}{(2^2)^{3n+2} \cdot \left(\frac{1}{2^3}\right)^{n+3}}$ $= \frac{2^{-6} \cdot 2^{3n-2}}{(2^2)^{3n+2} \cdot (2^{-3})^{n+3}}$ $= \frac{2^{-6+3n-2}}{2^{6n+4} \cdot 2^{-3n-9}}$ $= \frac{2^{-8+3n}}{2^{3n-5}}$ $= 2^{-3}$ $= \frac{1}{8}$	✓ Prime factors / <i>Priemfaktore</i> ✓ Exponential Property / <i>Eksponensiaal eienskap</i> ✓ Exponential Property / <i>Eksponensiaal eienskap</i> ✓ Exponential Property / <i>Eksponensiaal eienskap</i> ✓ Simplification / <i>Vereenvoudiging</i>	A CA CA CA	(5)

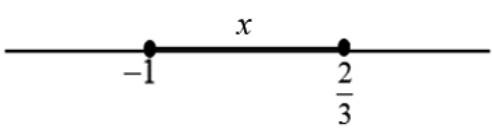
	<p>1.1.4</p>	$\frac{3\sqrt{8} + \sqrt{18}}{4\sqrt{50} - 2\sqrt{2}}$ $= \frac{3\sqrt{2^2 \cdot 2} + \sqrt{3^2 \cdot 2}}{4\sqrt{5^2 \cdot 2} - 2\sqrt{2}}$ $= \frac{3 \cdot 2\sqrt{2} + 3\sqrt{2}}{4 \cdot 5\sqrt{2} - 2\sqrt{2}}$ $= \frac{6\sqrt{2} + 3\sqrt{2}}{20\sqrt{2} - 2\sqrt{2}}$ $= \frac{9\sqrt{2}}{18\sqrt{2}}$ $= \frac{1}{2}$	<p>✓ Prime factors / <i>Priemfaktore</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p>	<p>(4)</p>
	<p>1.1.5</p>	$\frac{\log_x 27 + 3\log_x \sqrt[3]{9}}{2\log_x \sqrt{3}}$ $= \frac{\log_x 3^3 + 3\log_x \sqrt[3]{3^2}}{2\log_x \sqrt{3}}$ $= \frac{\log_x (3)^3 + 3\log_x (3)^{\frac{2}{3}}}{2\log_x (3)^{\frac{1}{2}}}$ $= \frac{3\log_x 3 + 3\left(\frac{2}{3}\right)\log_x 3}{2\left(\frac{1}{2}\right)\log_x 3}$ $= \frac{3\log_x 3 + 2\log_x 3}{\log_x 3}$ $= \frac{5\log_x 3}{\log_x 3}$ $= 5$	<p>✓ Prime factors / <i>Priemfaktore</i></p> <p>✓ Exponential forms / <i>Eksponeensiaal vorm</i></p> <p>✓ Log Property / <i>eienskap</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p>	<p>(5)</p>

1.1.6	$\frac{x^2 - 25}{x^2 + 7x + 10} - \frac{x^2 - 2x + 4}{x^3 + 8}$ $= \frac{(x-5)(x+5)}{(x+2)(x+5)} - \frac{x^2 - 2x + 4}{(x+2)(x^2 - 2x + 4)}$ $= \frac{x-5}{x+2} - \frac{1}{x+2}$ $= \frac{x-6}{x+2}$	<p>✓ $(x-5)(x+5)$</p> <p>✓ $(x+2)(x+5)$</p> <p>✓ $(x+2)(x^2 - 2x + 4)$</p> <p>✓ Simplification / Vereenvoudiging</p> <p>✓ Simplification / Vereenvoudiging</p>	<p>A</p> <p>A</p> <p>A</p> <p>CA</p> <p>CA</p>	(5)
1.2	110100_2 $= 2^5 \times 1 + 2^4 \times 1 + 2^3 \times 0 + 2^2 \times 1 + 2^1 \times 0 + 2^0 \times 0$ $= 32 + 16 + 4$ $= 52$ <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-top: 5px;">AO: 1 MARK / PUNT</div>	<p>✓ $32 + 16 + 4$ M</p> <p>✓ 52</p>	<p>A</p> <p>CA</p>	(2)
1.3	$\begin{array}{r} 0 \ 1 \ 1 \ 1 \\ 1 \ 1 \ 0 \ 0 \ 0_2 \\ \underline{- \ 1 \ 1 \ 1_2} \\ 1 \ 0 \ 0 \ 0 \ 1_2 \end{array}$	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">AO: 1/2</div> <p>✓ $1 \ 0 \ 0 \ 0 \ 1_2$</p>	<p>A</p> <p>A</p>	(2)
				[29]

QUESTION / VRAAG 2					
2.1	2.1.1	$40x^{\frac{3}{4}} = 5$ $x^{\frac{3}{4}} = \frac{5}{40}$ $x^{\frac{3}{4}} = \frac{1}{8}$ $\left(x^{\frac{3}{4}}\right)^{\frac{4}{3}} = \left(8^{-1}\right)^{\frac{4}{3}}$ $x = \left(2^{-3}\right)^{\frac{4}{3}}$ $x = 2^{-4}$ $x = \frac{1}{16}$	<p>✓ Simplification / Vereenvoudiging</p> <p>✓ Exponential Property / Eksponensiaal wet</p> <p>✓ Simplification / Vereenvoudiging</p> <p>✓ $\frac{1}{16}$</p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p>	(4)
	2.1.2	$\frac{3^{x+1} + 15 \cdot 3^{x-1}}{8 \cdot 9^x} = 27$ $\frac{3^x \cdot 3 + 15 \cdot 3^x \cdot 3^{-1}}{8 \cdot 3^{2x}} = 3^3$ $\frac{3^x \cdot 3 + \frac{15 \cdot 3^x}{3}}{8 \cdot 3^{2x}} = 3^3$ $\frac{3^x \cdot 3 + 5 \cdot 3^x}{8 \cdot 3^{2x}} = 3^3$ $\frac{3^x (3 + 5)}{8 \cdot 3^{2x}} = 3^3$ $\frac{8}{8 \cdot 3^x} = 3^3$ $\frac{1}{3^x} = 3^3$ $3^{-x} = 3^3$ $\therefore x = -3$	<p>✓ Prime factors / Priemfaktore</p> <p>✓ Simplification / Vereenvoudiging</p> <p>✓ Factors / Faktore</p> <p>✓ Simplification / Vereenvoudiging</p> <p>✓ x-value / waarde</p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p>	(5)

2.1.3	$\sqrt{8}(2\sqrt{x} + \sqrt{18}) = 1$ $2(\sqrt{8})(\sqrt{x}) + (\sqrt{8})(\sqrt{18}) = 1$ $2(\sqrt{4 \cdot 2})(\sqrt{x}) + \sqrt{144} = 1$ $4(\sqrt{2})(\sqrt{x}) = 1 - 12$ $4(\sqrt{2})(\sqrt{x}) = -11$ $\sqrt{x} = \frac{-11}{4\sqrt{2}}$ $x = \left(\frac{-11}{4\sqrt{2}}\right)^2$ $x = \frac{121}{16 \cdot 2}$ $x = \frac{121}{32}$	<p>✓ Expansion / <i>uitbreiding</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ $x = \frac{121}{32}$</p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p>	<p>(5)</p>
OR / OF				
	$\sqrt{8}(2\sqrt{x} + \sqrt{18}) = 1$ $2\sqrt{x} + \sqrt{18} = \frac{1}{\sqrt{8}}$ $2\sqrt{x} = \frac{1}{\sqrt{8}} - \sqrt{18}$ $2\sqrt{x} = \frac{1 - \sqrt{144}}{\sqrt{8}}$ $\sqrt{x} = \frac{1 - 12}{2\sqrt{8}}$ $x = \frac{121}{4 \times 8}$ $x = \frac{121}{32}$	<p>✓ $\frac{1}{\sqrt{8}}$</p> <p>✓ LCD / <i>KGV</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ Squaring both sides / <i>Kwadreer beide kante</i></p> <p>✓ $x = \frac{121}{32}$</p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p>	
2.1.4	$\log_3(x - 8) = -1$ $3^{-1} = x - 8$ $\frac{1}{3} + 8 = x$ $x = 8\frac{1}{3}$	<p>✓ Exponential form / <i>Eksponeensiaal vorm</i></p> <p>✓ Simplification / <i>Vereenvoudiging</i></p> <p>✓ $x = 8\frac{1}{3}$</p>	<p>A</p> <p>CA</p> <p>CA</p>	<p>(3)</p>

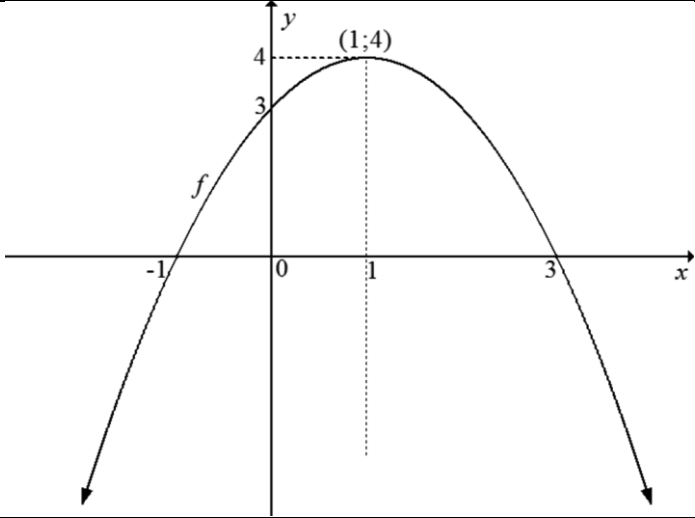
2.2	$\begin{aligned} \text{LHS} &= \log 25 + \log 8 - \log 2 \\ &= \log \left(\frac{25 \times 8}{2} \right) \\ &= \log (25 \times 4) \\ &= \log 100 \\ &= \log 10^2 \\ &= 2 \log 10 \\ &= 2 = \text{RHS} \end{aligned}$		\checkmark Log property / <i>eienskap</i> \checkmark Simplification / <i>Vereenvoudiging</i> $\checkmark \log 10^2$ \checkmark Simplification / <i>Vereenvoudiging</i>	A CA CA CA	(4)
2.3	2.3.1	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;"> AO: Full Marks <i>/ Volpunte</i> </div> $F_e = k \frac{Q_1 \times Q_2}{r^2}$ $F_e \times r^2 = k \times Q_1 \times Q_2$ $Q_2 = \frac{F_e \times r^2}{k \times Q_1}$	$\checkmark F_e \times r^2$ $\checkmark Q_2 = \frac{F_e \times r^2}{k \times Q_1}$	A CA	(2)
	2.3.2	$Q_2 = \frac{F_e \times r^2}{k \times Q_1}$ $Q_2 = \frac{3 \times 10^{-12} \times 3^2}{9 \times 10^{-9} \times 2 \times 10^{-2}}$ $Q_2 = \frac{3}{20} \text{ C}$	\checkmark Substitution / <i>Vervanging</i> $\checkmark \frac{3}{20} \text{ C}$	SF CA from/ vanaf 2.2.1 NPU CA	(2)
					[25]

QUESTION / VRAAG 3				
3.1	3.1.1	$(x-1)(x+2) = 4$ $x^2 + x - 2 = 4$ $x^2 + x - 6 = 0$ $(x+3)(x-2) = 0$ $x = -3$ or $x = 2$	✓ Expansion / <i>Uitbreiding</i> ✓ Standard Form / <i>Standaardvorm</i> ✓ Factors/ Substitution – <i>faktore / vervanging</i> ✓ $x = -3$ or/of $x = 2$	A CA CA CA CA (4)
	3.1.2	$3x^2 - 5 = x$ $3x^2 - x - 5 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(3)(-5)}}{2(3)}$ $x = \frac{1 \pm \sqrt{61}}{6}$ $x = 1,5$ or $x = -1,1$	✓ Standard Form / <i>standaardvorm</i> ✓ Substitution / <i>vervanging</i> ✓ $x = 1,5$ ✓ $x = -1,1$	A CA CA CA CA (4)
	3.1.3	$-3x^2 - x + 2 \geq 0$ $3x^2 + x - 2 \leq 0$ $(3x - 2)(x + 1) \leq 0$ Critical Values / <i>Kritiese waardes</i> : $\frac{2}{3}$ and / en -1 $-1 \leq x \leq \frac{2}{3}$ 	✓ Factors / Substitution – <i>faktore / vervanging</i> ✓ Critical values / <i>kritiese waardes</i> ✓ Notation / <i>Notasie</i> ✓ Number line / <i>Getalleglyn</i>	A CA CA CA CA (4)

<p>3.2</p>	$y - 2x = -1 \dots\dots\dots(1)$ $x^2 + x + y - y^2 = 0 \dots\dots\dots(2)$ $y = 2x - 1 \dots\dots\dots(3)$ $x^2 + x + 2x - 1 - (2x - 1)^2 = 0$ $x^2 + 3x - 1 - 4x^2 + 4x - 1 = 0$ $-3x^2 + 7x - 2 = 0$ $(-3x + 1)(x - 2) = 0$ $x = \frac{1}{3} \text{ or / of } x = 2$ $y = 2\left(\frac{1}{3}\right) - 1 \text{ or / of } y = 2(2) - 1$ $y = -\frac{1}{3} \text{ or / of } y = 3$ <p style="text-align: center;">OR / OF</p> $y - 2x = -1 \dots\dots\dots(1)$ $x^2 + x + y - y^2 = 0 \dots\dots\dots(2)$ $x = \frac{y+1}{2} \dots\dots\dots(3)$ $\left(\frac{y+1}{2}\right)^2 + \frac{y+1}{2} + y - y^2 = 0$ $\frac{y^2 + 2y + 1}{4} + \frac{y+1}{2} + y - y^2 = 0$ $y^2 + 2y + 1 + 2y + 2 + 4y - 4y^2 = 0$ $-3y^2 + 8y + 3 = 0$ $-3y^2 - y + 9y + 3 = 0$ $-y(3y + 1) + 3(3y + 1) = 0$ $(3y + 1)(-y + 3) = 0$ $y = -\frac{1}{3} \text{ or / of } y = 3$ $x = \frac{\left(-\frac{1}{3}\right) + 1}{2} \text{ or / of } x = \frac{3+1}{2}$ $x = \frac{1}{3} \text{ or / of } x = 2$	$\checkmark \text{ Equation / vergelyking} \quad (3) \quad \mathbf{A}$ $\checkmark \text{ Substitution / substitusie} \quad \mathbf{SF}$ $\checkmark \text{ Simplification / Vereenvoudiging} \quad \mathbf{CA}$ $\checkmark \text{ Standard form / standaardvorm} \quad \mathbf{CA}$ $\checkmark \text{ Factors/ Substitution - faktore / substitusie} \quad \mathbf{S}$ $\checkmark \text{ Factors/ Substitution - faktore / substitusie} \quad \mathbf{CA}$ $\checkmark x = \frac{1}{3} \text{ or / of } x = 2 \quad \mathbf{CA}$ $\checkmark y = -\frac{1}{3} \text{ or / of } y = 3 \quad \mathbf{CA}$ <p style="text-align: center;">OR / OF</p> $\checkmark \text{ Equation/Vergelyking} \quad (3)$ $\checkmark \text{ Substitution / Substitusie}$ $\checkmark \text{ Simplification / Vereenvoudiging}$ $\checkmark \text{ Standard form / standaardvorm} \quad \mathbf{S}$ $\checkmark \text{ Factors/ Substitution / Faktore / Substitusie}$ $\checkmark y = -\frac{1}{3} \text{ or / of } y = 3$ $\checkmark x = \frac{1}{3} \text{ or / of } x = 2$	<p style="text-align: right;">(7)</p>
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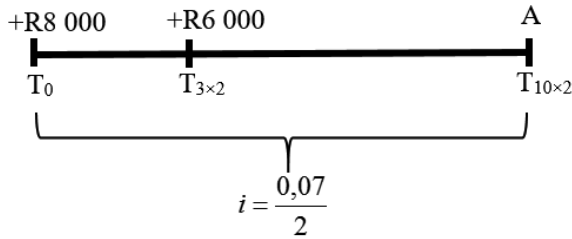
3.3	3.3.1	cm	m		✓ Method / <i>metode</i>	A	
		100	1				
		200	$\frac{200 \text{ cm} \times 1 \text{ m}}{100 \text{ cm}} = 2 \text{ m}$				
					✓ 2m	CA	(2)
	3.3.2	$V = l \times w \times h$ $V = 5 \times 2 \times 3$ $V = 30 \text{ m}^3$			✓ Formula / <i>formule</i> ✓ Substitution / <i>Substitusie</i> ✓ 30 m^3	A CA CA	NPU (3)
	3.3.3	Volume of all plastic drums / <i>Volume van alle plastiekvate</i> $= 30 \text{ m}^3 - 0.5 \text{ m}^3$ $= 29,5 \text{ m}^3$ Volume of a single drum / <i>Volume van 'n vat</i> $= \frac{29,5 \text{ m}^3}{80 \text{ drums}} = 0,37 \text{ m}^3$			✓ Difference / <i>Verskil</i> M ✓ 29,5 ✓ M ✓ $0,37 \text{ m}^3$	A CA CA	(4)
							[28]
QUESTION / VRAAG 4							
4.1	$\frac{-x+3}{x+1} = 0$ $\therefore x = 3$	AO: FULL MARKS / <i>VOLPUNTE</i>			✓ $\frac{-x+3}{x+1} = 0$ ✓ $x = 3$	A CA	(2)
4.2	$x + 1 = 0$ $x = -1$	AO: FULL MARKS / <i>VOLPUNTE</i>			✓ $x + 1 = 0$ ✓ $x = -1$	A A	(2)
4.3	$\frac{-x+3}{x+1} = \frac{-1+3}{1+1}$ $= 1$ \therefore Roots are Real, Rational and Unequal. \therefore <i>Wortels is Reëel, Rasionaal en Ongelyk</i>				✓ Substitution / <i>Substitusie</i> ✓ 1 ✓ Real and Unequal / <i>Reël en ongelyk</i> ✓ Rational / <i>Rasionaal</i>	A CA CA	(4)
							[8]

QUESTION / VRAAG 5				
5.1	$y = 2(0) + 2$ $y = 2$ B (0 ; 2)	$\checkmark x = 0$ $\checkmark y = 2$	A A	(2)
OR/OF				
	$y = 3^0 + 1$ $y = 2$ B (0 ; 2)	$\checkmark x = 0$ $\checkmark y = 2$	A A	
5.2	$0 = 2x + 2$ $x = -1$ A (-1; 0)	$\checkmark y = 0$ $\checkmark x = -1$	A CA	(2)
5.3	$y = 1$	$\checkmark y = 1$	A	(1)
5.4	$x \in \{\text{Real numbers / getalle}\}$	\checkmark $x \in \{\text{Real numbers / getalle}\}$	A	(1)
5.5	$x < 0$ or/of $1 < x$	$\checkmark x < 0$ $\checkmark 1 < x$	A A	(2)
5.6	Both g and h are increasing functions because y increases as x increases in both cases. <i>Beide g en h is stygende funksies omdat y vermeerder as x in beide gevalle vermeerder.</i>	\checkmark Increasing / <i>Vermeerder</i> $\checkmark y$ increases as x increases y vermeerder as x vermeerder	A A	(2)
5.7	$f(x) = 3^{x-1} + 1$	$\checkmark 3^{x-1}$ $\checkmark 1$	A A	(2)
5.8	Area of $\Delta AOB = \frac{1}{2} AO \times OB$ Oppervlakte van $\Delta AOB = \frac{1}{2}(1)(2)$ = 1 square unit / <i>vierkante eenhede</i>	\checkmark Formula / <i>formule</i> $\checkmark AO = 1$ $\checkmark OB = 2$ \checkmark 1 square unit / <i>vierkante eenhede</i>	A CA CA CA	(4)
				[16]

QUESTION / VRAAG 6				
6.1	$x = 1$		$\checkmark x = 1$	A (1)
6.2	$f(x) = -(x-1)^2 + 4$ $f(0) = -(0-1)^2 + 4$ $f(0) = 3$	AO: FULL MARKS / VOLPUNTE	\checkmark Substitute/ <i>Vervang</i> $x = 0$ \checkmark y intercept/ <i>afsnit</i> is 3	A CA (2)
6.3	$f(x) = -(x-1)^2 + 4$ $0 = -(x-1)^2 + 4$ $(x-1)^2 = 4$ $x-1 = \pm 2$ $x = 3$ or / <i>of</i> $x = -1$		$\checkmark f(x) = 0$ \checkmark Simplification / <i>vereenvoudiging</i> $\checkmark x = 3$ $\checkmark x = -1$	A CA CA CA
OR / OF				
	$f(x) = -(x-1)^2 + 4 = 0$ $-(x^2 - 2x + 1) + 4 = 0$ $-x^2 + 2x + 3 = 0$ $(-x+3)(x+1) = 0$ $x = 3$ or / <i>of</i> $x = -1$		$\checkmark f(x) = 0$ \checkmark Factors / <i>faktore</i> $\checkmark x = 3$ $\checkmark x = -1$	A CA CA CA (4)
6.4	(1; 4)		$\checkmark 1$ $\checkmark 4$	A A (2)
6.5			\checkmark Shape / <i>vorm</i> \checkmark Turning Point / <i>draaipunt</i> \checkmark y – intercept / <i>afsnit</i> \checkmark x – intercepts / <i>afsnitte</i>	A CA CA CA (4)

6.6	$y \leq 4$ OR/OF $y \in (-\infty ; 4]$ OR/OF $-\infty < y \leq 4$ OR/OF $-\infty < y$ and/en $y \leq 4$	✓ Critical value / <i>Kritiese waarde</i> ✓ correct notation / <i>korrekte notasie</i>	CA CA	(2)
6.7	f has a maximum turning point because the coefficient of $(x - 1)^2$ is less than zero <i>f het 'n maksimum draaipunt omdat die koëffisient van $(x - 1)^2$ minder as nul is</i> OR / OF f has a maximum turning point because $a < 0$ <i>f het 'n maksimum draaipunt omdat $a < 0$</i>	✓ Maximum turning Point / <i>Maksimum draaipunte</i> ✓ coefficient of <i>koëffisient</i> van $(x - 1)^2$ is less than zero / <i>is minder as nul</i> OR OF ✓ Maximum turning Point / <i>Maksimum draaipunte</i> ✓ $a < 0$	A A	(2)
				[17]
QUESTION / VRAAG 7				
7.1	$r = 3$ $r^2 = 3^2 = 9$ $x^2 + y^2 = 9$	✓ $r = 3$ ✓ $r^2 = 9$ ✓ $x^2 + y^2 = 9$	A CA CA	(3)
7.2	$q = -1$	✓ -1	A	(1)
7.3	$0 = \frac{a}{-2} - 1$ $a = -2$ $k(x) = \frac{-2}{x} - 1$	✓ Substitute/ <i>Vervang</i> $(-2 ; 0)$ and / <i>en</i> -1 ✓ Simplification / <i>Vereenvoudiging</i> ✓ equation of/ <i>vergelyking</i> van k	CA CA CA	(3)
7.4	$f(x) = \frac{2}{x} + 1$	✓ $\frac{2}{x}$ ✓ 1	A A	(2)
				[9]

QUESTION / VRAAG 8					
8.1	8.1.1	$i_{eff} = \left(1 + \frac{i}{m}\right)^m - 1$ $i_{eff} = \left(1 + \frac{0.06}{12}\right)^{12} - 1$ $i_{eff} = 0.0617$ Rate = 6,17%	✓ SF ✓ Simplification / Vereenvoudiging ✓ rate/koers = 6,17%	A CA CA	(3)
	8.1.2	$A = P(1-i)^n$ $1\ 200 = P\left(1 - \frac{0,06}{12}\right)^{3 \times 12}$ P = R1 437,31	✓ Formula / Formule ✓ Substitution / Substitusie ✓ R1 437,31	A SF CA	(3)
8.2	8.2.1	2000	✓ 2000	A	(1)
	8.2.2	Simple interest / Enkelvoudige rente	✓ Simple interest / Enkelvoudige rente	A	(1)
	8.2.3	$A = P(1+in)$ $10\ 000 = 2000(1+16i)$ $5 - 1 = 16i$ $i = 0,25$ $r = 25\%$ ∴ The production grew at 25% per annum Die produksie groei teen 25% per jaar	✓ SF ✓ Simplification / Vereenvoudiging ✓ $r = 25\%$	CA CA CA	(3)
	8.2.4	$A = 2000(1+19 \times 0.25)$ A = 11 500 plastic bags / plastiek sakke	✓ Substitute/ Vervang 2000 ✓ Substitute/Vervang in ✓ 11 500	SF SF CA	(3)

<p>8.3</p>  $A_3 = 8000 \left(1 + \frac{0,07}{2} \right)^{3 \times 2} + 6000$ $A_3 = R15\,834,04261$ $A_{10} = 15\,834,04261 \left(1 + \frac{0,07}{2} \right)^{7 \times 2}$ $A_{10} = R25\,630,48$ <p style="text-align: center;">OR/OF</p> $A_{8000} = 8000 \left(1 + \frac{0,07}{2} \right)^{10 \times 2}$ $A_{8000} = R15\,918,31091$ $A_{6000} = 6000 \left(1 + \frac{0,07}{2} \right)^{7 \times 2}$ $\therefore A_{6000} = R9\,712,167135$ $\therefore A_{10} = R15\,918,31091 + R9\,712,167135$ $A_{10} = R25\,630,48$	<p>✓ SF</p> <p>✓ Add/tel by R6 000 M</p> <p>✓ SF</p> <p>✓ R25 630,48</p> <p style="text-align: center;">OR/OF</p> <p>✓ SF</p> <p>✓ SF</p> <p>✓ M</p> <p>✓ R25 630,48</p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>A</p> <p>A</p> <p>CA</p> <p>CA</p>	<p>(4)</p> <p>[18]</p>
TOTAL/TOTAAL:			150