Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

JUNE 2025

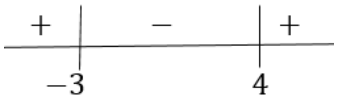
MATHEMATICS P1
MARKING GUIDELINE

MARKS: 100

This marking guideline consists of 9 pages.

QUESTION 1

1.1 1.1.1	$(2x-4)(x+1)=0$ $2x=4$ or $x=-1$ $x=2$	✓ Equating to 0 ✓ $x=2$ ✓ $x=-1$ (3)
1.1.2	$3x^2-5x-4=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $x=\frac{-(-5)\pm\sqrt{(-5)^2-4(3)(-4)}}{2(3)}$ $x=2{,}26$ or $x=-0{,}59$	✓ Correct substitution in correct formula ✓ Answer ✓ Answer (3) [penalise 1 mark for wrong rounding off]
1.1.3	$x^2-2x=18-\frac{45}{x^2-2x}$ Restriction $x^2-2x\neq 0$ OR $x\neq 0$ Let $k=x^2-2x$ $k=18-\frac{45}{k}$ $k^2=18k-45$ $k^2-18k+45=0$ $(k-15)(k-3)=0$ $k=15$ or $k=3$ Substitute $2x^2-2x$ back for k $x^2-2x=15$ or $x^2-2x=3$ $x^2-2x-15=0$ or $x^2-2x-3=0$ $(x+3)(x-5)=0$ or $(x-3)(x+1)=0$ $x=-3$ or $x=5$ or $x=3$ or $x=-1$	✓ Restriction ✓ Values of k ✓ Equating ✓ All factors ✓ All x −values (5)
1.1.4	$\sqrt{x+6}-x=4$ $(\sqrt{x+6})^2=(x+4)^2$ $x+6=x^2+8x+16$ $x^2+8x-x+16-6=0$ $x^2+7x+10=0$ $(x+2)(x+5)=0$ $x=-2$ or $x=-5$ $\therefore x=-2$	✓ Isolating the surd and Squaring both sides ✓ Standard form ✓ Both x −values ✓ Conclusion (4)

1.1.5	$5^{3x} - 5^{3x-1} = 4$ $5^{3x} - 5^{3x}.5^{-1} = 4$ $5^{3x}(1 - 5^{-1}) = 4$ $5^{3x}\left(1-\frac{1}{5}\right)=4$ $5^{3x}\left(\frac{4}{5}\right)=4$ $5^{3x}=4\div\frac{4}{5}$ $5^{3x}=4\times\frac{5}{4}$ $5^{3x}=5$ $3x=1$ $x=\frac{1}{3}$	✓ Common factor ✓ Simplification ✓ Equating exponents ✓ Answer (4)
1.1.6	(a) $x^2 - x - 12 > 0,\ x < 0$ $(x-4)(x+3) > 0$ C.V $x = 4$ or $x = -3$  $x < -3$ or $x > 4$ $\therefore x < -3$	✓ Factors ✓ Critical values ✓ Answer ✓ Conclusion (4)
	(b) $x < -1$ or $x > 6$	✓ ✓Answer (2)
1.2	$x + y = -11$ ……. (1) $xy = -570$ …….. (2) From (1) $x = -11 - y$ ……. (3) Substitute (3) into (2) $y(-11 - y) = -570$ $-y^2 - 11y + 570 = 0$ $y^2 + 11y - 570 = 0$ $(y + 30)(y - 19) = 0$ $y = -30$ or $y = 19$ Substitute y into (3) $x = -11 - (-30)$ or $x = -11 - (19)$ $x = -11 + 30$ or $x = -11 - 19$ $x = 19$ or $x = -30$	✓ Setting up equations ✓ Substitution (3) into (1) ✓ Standard form ✓ Factors ✓ Both y −values ✓ Both x −values (6)

1.3	$2x^2 + 3x - 5 = 0$ $\Delta = b^2 - 4ac$ $\Delta = (3)^2 - 4(2)(-5)$ $\Delta = 9 + 40$ $\Delta = 49$ $\therefore$ roots are real, rational and unequal.	✓ Substitution ✓ $\Delta = 49$ ✓ Answer (3)
		[34]

QUESTION 2

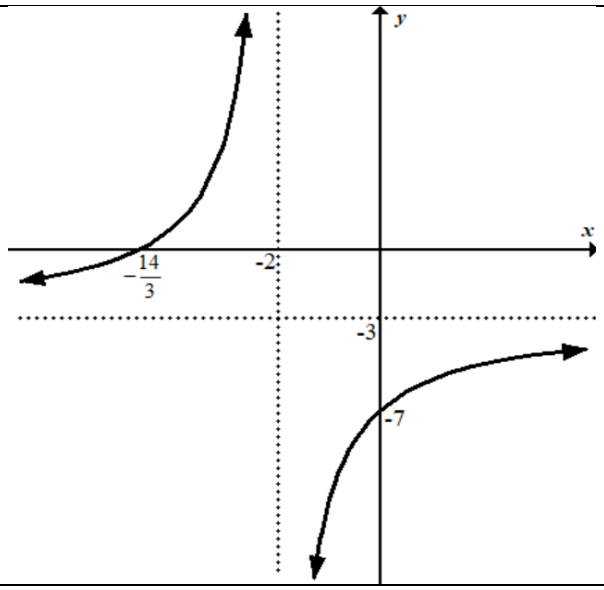
2.1 2.1.1	$\sqrt[3]{\sqrt{83} - \sqrt{19}} \cdot \sqrt[3]{\sqrt{83} + \sqrt{19}}$ $= \sqrt[3]{(\sqrt{83} - \sqrt{19})(\sqrt{83} - \sqrt{19})}$ $= \sqrt[3]{83 + \sqrt{83}.\sqrt{19} - \sqrt{83}.\sqrt{19} - 19)}$ $= \sqrt[3]{83 - 19}$ $= \sqrt[3]{64}$ $= \sqrt[3]{2^6}$ $= 2^{\frac{6}{3}}$ $= 2^2$ $= 4$	✓ Simplifying surds ✓ Simplification ✓ Answer (3)
2.1.2	$\frac{\sqrt{80} + \sqrt{45}}{\sqrt{45}}$ $= \frac{\sqrt{16 \times 5} + \sqrt{9 \times 5}}{\sqrt{9 \times 5}}$ $= \frac{4\sqrt{5} + 3\sqrt{5}}{3\sqrt{5}}$ $= \frac{7\sqrt{5}}{3\sqrt{5}}$ $= \frac{7}{3}$	✓ Simplification of surds ✓ Simplification ✓ Answer (3)

2.1.3	$\frac{4^{n+2}-4^{n-1}}{4^{n+1}}$ $=\frac{2^{2(n+2)}-2^{2(n-1)}}{2^{2(n+1)}}$ $=\frac{2^{2n+4}-2^{2n-2}}{2^{2n+2}}$ $=\frac{2^{2n}(2^4-2^{-2})}{2^{2n}(2^2)}$ $=\frac{16-\frac{1}{4}}{4}$ $=\frac{63}{16}$ **OR** $=\frac{4^n.4^2-4^n.4^{-1}}{4^n.4^1}$ $=\frac{4^n(4^2-4^{-1})}{4^n.4^1}$ $=\frac{16-\frac{1}{4}}{4}$ $=\frac{63}{16}$	✓ Rewritting with prime bases ✓ Common factor ✓ Answer **OR** ✓ Applying exponential law ✓ Common factor ✓ Answer (3)
2.2 2.2.1	$x=\sqrt{30+\sqrt{30+\sqrt{30+\cdots}}}$ $x^2=30+\sqrt{30+\sqrt{30+\cdots}}$ $x^2=30+x$	✓ Method ✓ Answer (2)
2.2.2	$x^2=30+x$ $x^2-x-30=0$ $(x-6)(x+5)=0$ $x=6$ or $x=-5$ $\therefore x=6$	✓ Standard form ✓ Factors ✓ Answer ✓ Conclusion (4)

2.3	$BC^2 = BD^2 + CD^2$ (P.T) $BC^2 = (\sqrt{13}-1)^2 + (\sqrt{13}+1)^2$ $BC^2 = 13 - 2\sqrt{13} + 1 + 13 + 2\sqrt{13} + 1$ $BC^2 = 14 + 14$ $BC^2 = 28$ $BC = \sqrt{28}$ $BC = 2\sqrt{7}$	✓ Method ✓ $BC^2 = 28$ ✓ Answer (3)
		[18]

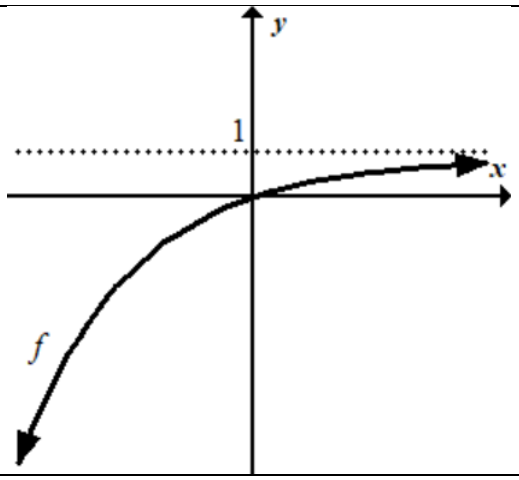
QUESTION 3

3.1	$f(x) = \frac{-14-3x}{x+2}$ $= \frac{-3x-6-8}{x+2}$ $= \frac{-3(x+2)-8}{x+2}$ $= \frac{-3\cancel{(x+2)}}{\cancel{x+2}} - \frac{8}{x+2}$ $= -3 - \frac{8}{x+2}$ $= \frac{-8}{x+2} - 3$ $\therefore f(x) = \frac{-8}{x+2} - 3$	✓ Spliting the expression ✓ Simplification (2)
3.2	$y = -3$ $x = -2$	✓ $y = -3$ ✓ $x = -2$ (2)
3.3	For $x-$intercept let $y = 0$ $0 = \frac{-8}{x+2} - 3$ $\frac{-8}{x+2} = 3$ $-8 = 3x + 6$ $x = -\frac{14}{3}$ For $y-$intercept let $x = 0$ $y = \frac{-8}{0+2} - 3$ $y = -7$	✓ Equating to 0 ✓ $x-$intercept ✓ $y-$intercept (3)

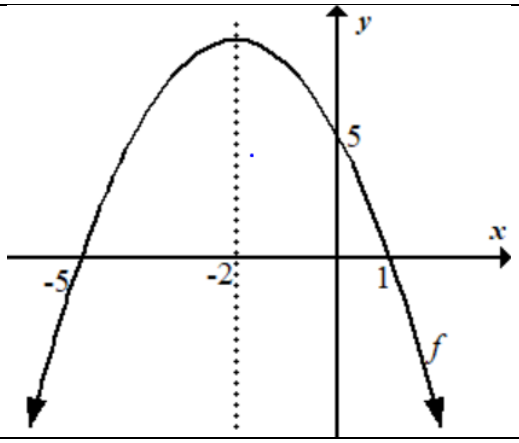
3.4		✓ Shape ✓ Both asymptotes ✓ Both intercepts (3)
3.5	$y = x + k$ $-3 = -2 + k$ $-3 + 2 = k$ $-1 = k$	✓ Substitution ✓ Answer (2)
3.6	$B(-4; 6) \rightarrow B'(7; -5)$	✓ x −value ✓ y −value (2)
		[14]

QUESTION 4

4.1	$f(x) = -2^{-x} + 1$ For y −intercept let $x = 0$ $y = -2^{-0} + 1$ $y = 0$ $(0; 0)$ For x −intercept let $y = 0$ $0 = -2^{-x} + 1$ $2^{-x} = 1$ $2^{-x} = 2^0$ $x = 0$ $(0; 0)$	✓ $x = 0$ ✓ $(0; 0)$ ✓ $y = 0$ ✓ $(0; 0)$ (4)
4.2	$y = 1$	✓ Answer (1)

4.3		✓ Shape ✓ Asymptote ✓ $x-$ and $y-$intercepts (3)
4.4	$g(x) = -2^{-x-1} + 1$	✓ Answer (1)
4.5	$-2^{-x} + 1 = -3$ $-2^{-x} = -4$ $2^{-x} = 4$ $2^{-x} = 2^2$ $-x = 2$ $x = -2$	✓ Equating to -3 ✓ Simplification ✓ Answer (3)
		[12]

QUESTION 5

5.1		✓ Shape ✓ $x-$intercepts ✓ ✓ $y-$intercept ✓ axis of symmetry (5)
5.2 5.2.1	B$(0;-5)$	✓ Answer (1)
5.2.2	$k = -5$	✓ Answer (1)
5.2.3	For $x-$intercept let $y = 0$ $x^2 + 4x - 5 = 0$ $(x+5)(x-1) = 0$ $x = -5$ or $x = 1$ $\therefore$A$(-5;0)$ AD $= 1 - (-5) = 6$	✓ Factors ✓ $x-$values ✓ Length of AD (3)

5.2.4	$x = \frac{-b}{2a}$ $x = \frac{-(4)}{2(1)}$ $x = -2$ $f(-2) = -9$ $C(-2;-9)$ **OR** $x_c = \frac{-5+1}{2}$ $x_c = -2$ $f(-2) = -9$ $C(-2;-9)$	✓ $x = -2$ ✓ Answer (2) **OR** ✓ $x = -2$ ✓ Answer (2)
5.2.5	$m_1 \times m_2 = -1$ $m_1 \times -1 = -1$ $m_1 = 1$ $y - y_1 = m(x - x_1)$ $y - (-9) = 1(x - (-2))$ $y + 9 = (1(x + 2)$ $y = x + 2 - 9$ $y = x - 7$ $\therefore h(x) = x - 7$	✓ Gradient ✓ Substitution ✓ Equation (3)
5.2.6	Average gradient $= \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{-5+9}{0+2}$ $= \frac{4}{2}$ $= 2$ $\therefore m_{BC} = 2$	✓ Substitution ✓ Answer (2)
5.2.7	$T(-4;-5)$	✓ x −value ✓ y −value (2)
5.2.8	(a) $x = 0$ or $x = 5$	✓ Answer ✓ (2)
	(b) $x > 1$	✓ Answer (1)
		[22]

TOTAL :100