KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

FINAL

PROVINCIAL STANDARDISED ASSESSMENT

GRADE 11

MATHEMATICS P1

JUNE 2026

MARKING GUIDELINES

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MARKS: 100

These marking guidelines consist of 10 pages.

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QUESTION 1

1.1.1	$-x(x-3)=0$ $x=0$ or $x=3$	✓A $x=0$ ✓A $x=3$ (2)
1.1.2	$x^2-100=0$ $(x+10)(x-10)=0$ $x=-10$ *or* $x=10$ **OR** $x^2-100=0$ $x^2=100$ $x=-10$ or $x=10$	✓A correct factors ✓CA answer ✓CA answer (3) ✓A isolating x^2 ✓CA answer ✓CA answer (3)
1.1.3	$3x-5=\frac{3}{x}$ $3x^2-5x-3=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $x=\frac{-(-5)\pm\sqrt{(-5)^2-4(3)(-3)}}{2(3)}$ $x=-0,47$ or $x=2,14$ **Penalise ONE mark for incorrect rounding**	✓A correct standard form ✓CA correct substitution into quadratic formula ✓CA answer ✓CA answer (4)
1.1.4	$(x-3)(x+4)\geq 8$ $x^2+4x-3x-12-8\geq 0$ $x^2+x-20\geq 0$ $(x+5)(x-4)\geq 0$ Critical Values: -5 and 4  $x\leq -5$ or $x\geq 4$ **OR** $x\in(-\infty;-5]\cup[4;\infty)$	✓A correct standard form ✓CA critical values (**accept critical values** if shown on a sketch or number line) ✓✓CA answer (4)
1.1.5	$x+\sqrt{x-2}=4$ $\sqrt{x-2}=4-x$ $\left(\sqrt{x-2}\right)^2=(4-x)^2$ $x-2=16-8x+x^2$ $x^2-9x+18=0$ $(x-6)(x-3)=0$ $x\neq 6$ or $x=3$ **B/D if standard form is not quadratic**	✓A isolating the surd ✓M squaring both sides ✓CA standard form ✓✓CA answer with selection (5)

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1.2	let son's age $= x$ and daughter's age $= x-2$	
	sum $= x+(x-2)$	✓A sum of ages
	$= 2x-2$	
	Product $= \frac{3}{4}x(x-2)$	✓A ¾ product of ages
	$= \frac{3}{4}x^2 - \frac{3}{2}x$	
	$\therefore 2x-2 = \frac{3}{4}x^2 - \frac{3}{2}x$	
	$0 = \frac{3}{4}x^2 - \frac{3}{2}x - 2x + 2$	
	$\frac{3}{4}x^2 - \frac{7}{2}x + 2 = 0$	
	$3x^2 - 14x + 8 = 0$	✓CA standard form
	$(3x-2)(x-4) = 0$	
	$x \neq \frac{2}{3}$ or $x = 4$	
	son = 4 years old & daughter = 2 years old	✓CA son's age CA✓daughter's age (5)
	B/D if ages are NOT natural numbers	
	OR	
	let daugther's age $= x$ and son's age $= x+2$	
	sum $= x+(x+2)$	✓A sum of ages
	$= 2x+2$	
	Product $= \frac{3}{4}x(x+2)$	✓A ¾ product of ages
	$= \frac{3}{4}x^2 + \frac{3}{2}x$	
	$\therefore 2x+2 = \frac{3}{4}x^2 + \frac{3}{2}x$	
	$\frac{3}{4}x^2 + \frac{3}{2}x - 2x - 2 = 0$	
	$\frac{3}{4}x^2 - \frac{1}{2}x - 2 = 0$	
	$3x^2 - 2x - 8 = 0$	✓CA standard form
	$(3x+4)(x-2) = 0$	
	$x \neq -\frac{4}{3}$ or $x = 2$	
	daughter = 2 years old & son = 4 years old	✓CA son's age CA✓daughter's age (5)
	B/D if ages are NOT natural numbers	

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1.3	$xy = 2x + 10$ $y = 2 + \frac{10}{x}$ values of x for $y \in \mathbb{N}$ are 1; 2; 5 and 10 correspoding values of y are 12; 7; 4 and 3 $\therefore$ maximum value of xy is 30 **NO CA for showing answer only**	✓A expressing y in terms of x ✓A x-values: 1 ; 2 ; 5 and 10 ✓A y-values: 12 ; 7 ; 4 and 3 ✓CA answer (4)
		[27]

QUESTION 2

2.1.1	$\sqrt{\sqrt{81}x^6}$ $= \sqrt{9x^6}$ $= 3x^3$	✓A $\sqrt{9x^6}$ ✓CA answer (2)
2.1.2	$\frac{25^{k+1}.10^k}{8^k.125^k.2^{-2k}}$ $= \frac{\left(5^2\right)^{k+1}.(5\times 2)^k}{\left(2^3\right)^k.\left(5^3\right)^k.2^{-2k}}$ $= \frac{5^{2k+2}.5^k.2^k}{2^{3k}.5^{3k}.2^{-2k}}$ $= 5^{2k+2+k-3k}.2^{k-3k+2k}$ $= 5^2.2^0$ $= 25$	✓A rewriting with prime bases ✓CA exponential laws ✓CA simplifying: exponential laws ✓CA answer (4)
2.1.3	$\sqrt{\frac{3^{2026}+3^{2024}}{2^{-2}.3^{2022}}}$ $= \sqrt{\frac{3^{2024}(3^2+1)}{2^{-2}.3^{2022}}}$ $= \sqrt{3^2(10).2^2}$ $= \sqrt{360}$ $= 6\sqrt{10}$ **OR** $\sqrt{\frac{3^{2026}+3^{2024}}{2^{-2}.3^{2022}}}$ $= \sqrt{\frac{3^{2022}(3^4+3^2)}{2^{-2}.3^{2022}}}$ $= \sqrt{2^2(90)}$ $= \sqrt{360}$ $= 6\sqrt{10}$	✓A common factor in numerator ✓CA exponential laws Stanmorephysics ✓CA answer (3) ✓A common factor in numerator ✓CA exponential laws ✓CA answer (3)

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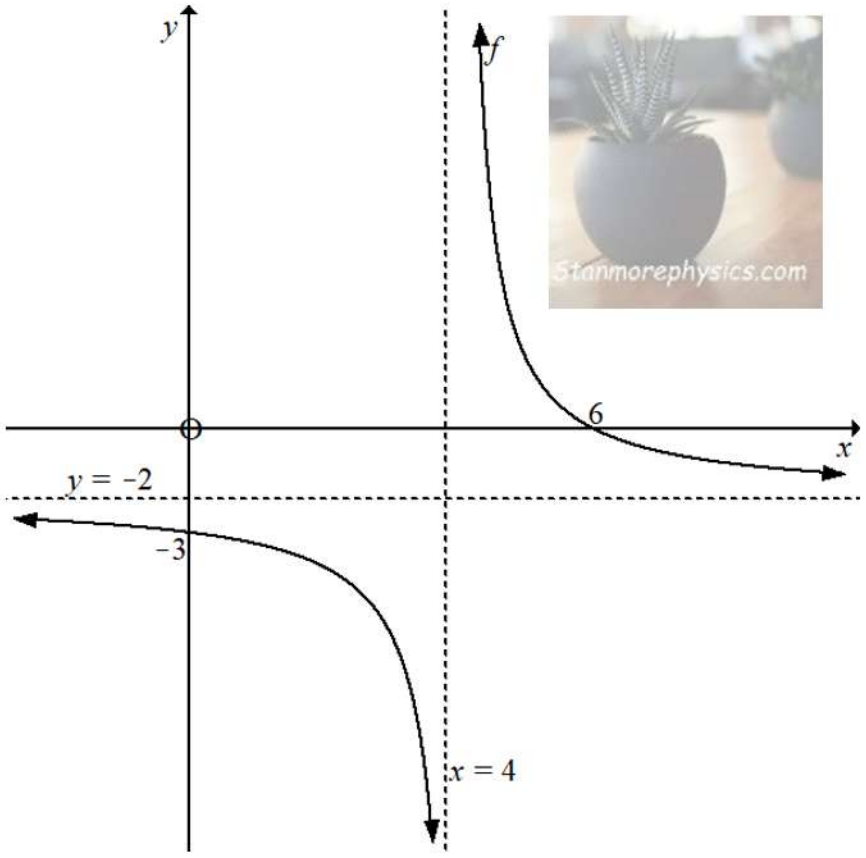
	OR $\sqrt{\frac{3^{2026}+3^{2024}}{2^{-2}.3^{2022}}}$ $=\sqrt{\frac{3^{2026}}{2^{-2}.3^{2022}}+\frac{3^{2024}}{2^{-2}.3^{2022}}}$ $=\sqrt{2^2.3^4+2^2.3^2}$ $=\sqrt{360}$ $=6\sqrt{10}$	✓A splitting the fraction ✓A simplification: exponential laws ✓CA answer (3)
2.2.1	$3x^{-\frac{5}{3}}-96=0$ $3x^{-\frac{5}{3}}=96$ $x^{-\frac{5}{3}}=32$ $x^{-\frac{5}{3}\times-\frac{3}{5}}=2^{5\times-\frac{3}{5}}$ $x=2^{-3}$ $x=\frac{1}{8}$	✓A simplifying to $x^{-\frac{5}{3}}=32$ ✓A multiplying both exponents by $-\frac{3}{5}$ ✓CA answer (3)
2.2.2	$27^x=243.\sqrt[x]{9}$ $3^{3x}=3^5.3^{\frac{2}{x}}$ $3^{3x}=3^{5+\frac{2}{x}}$ $3x=5+\frac{2}{x}$ $3x^2-5x-2=0$ $(3x+1)(x-2)=0$ $x=-\frac{1}{3}$ or $x=2$ **OR** $27^x=243.\sqrt[x]{9}$ $\left(27^x\right)^x=\left(243.\sqrt[x]{9}\right)^x$ $27^{x^2}=243^x.9$ $3^{3x^2}=3^{5x}.3^2$ $3x^2=5x+2$ $3x^2-5x-2=0$ $(3x+1)(x-2)=0$ $x=-\frac{1}{3}$ or $x=2$	✓A 3^{3x} and ✓A $3^{\frac{2}{x}}$ ✓CA equating exponents ✓CA standard form ✓CA answers (5) ✓A 3^{3x^2} and ✓A 3^{5x} ✓CA equating of exponents ✓CA standard form ✓CA answers (5)

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2.3	$\sqrt{32}-\sqrt{18}+\sqrt[3]{6}.\sqrt[3]{4}$ $=\sqrt{16\times 2}-\sqrt{9\times 2}+\sqrt[3]{6\times 4}$ $=4\sqrt{2}-3\sqrt{2}+\sqrt[3]{24}$ $=\sqrt{2}+\sqrt[3]{8\times 3}$ $=\sqrt{2}+2.\sqrt[3]{3}$ $=a^2+2b$	A✓ $\sqrt[3]{24}$ A✓ $\sqrt{2}$ A✓ $2.\sqrt[3]{3}$ A✓ a^2 & A✓ $2b$ (5)
		[22]



QUESTION 3

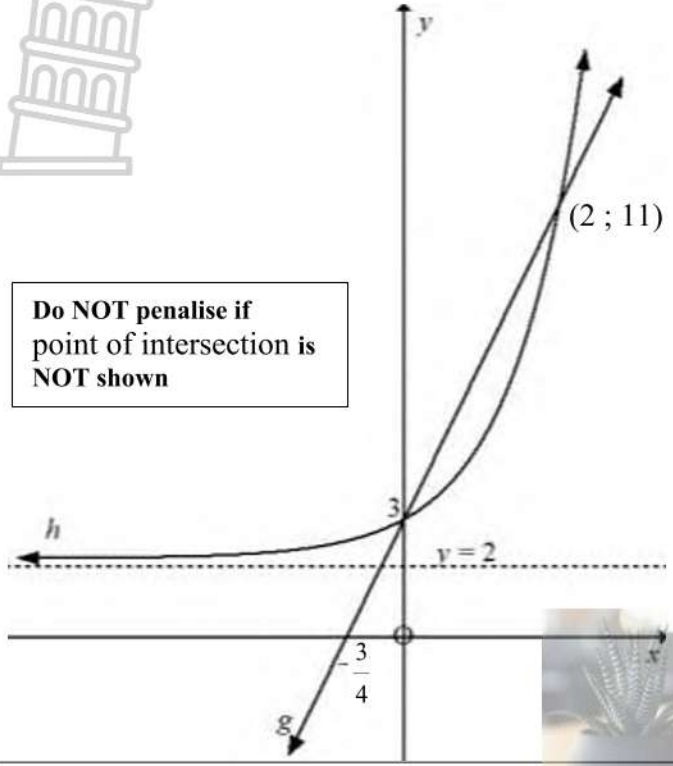
3.1	$x = 4$ $y = -2$ **Award 0/2 if a learner used p and q**	✓A answer ✓A answer (2)
3.2	$f(0) = \frac{4}{0-4} - 2$ $y = -3$	✓A $f(0)$ **OR** subst. $x = 0$ ✓CA value of y (2)
3.3	$f(x) = \frac{4}{x-4} - 2$ $0 = \frac{4}{x-4} - 2$ $2 = \frac{4}{x-4}$ $2x - 8 = 4$ $2x = 12$ $x = 6$	✓A $f(x) = 0$ **OR** subst. $y = 0$ ✓A simplification after cross multiplying ✓CA value of x (3)
3.4		✓A shape ✓CA both asymptotes ✓CA both intercepts (3)
3.5	$4 < x \leq 6$ **OR** $x \in (4\ ;\ 6]$	✓CA✓CA answer (2) ✓CA✓CA answer (2)

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3.6	$y = mx + c$ $-2 = 1(4) + c$ $c = -6$ $\therefore y = x - 6$ **Answer only FULL marks** **OR** $y - y_1 = m(x - x_1)$ $y - (-2) = 1(x - 4)$ $y + 2 = x - 4$ $y = x - 6$ **Answer only FULL marks**	✓CA subst. of pos. gradient and point of intersection of asymptotes ✓CA answer (2) ✓CA subst. of pos. gradient and point of intersection of asymptotes ✓CA answer (2)
3.7	$\frac{4}{x-4} - 2 = x - 6$ $\frac{4}{x-4} = x - 4$ $(x-4)^2 = 4$ $x^2 - 8x + 16 - 4 = 0$ $x^2 - 8x + 12 = 0$ $(x-2)(x-6) = 0$ $x = 2$ or $x \neq 6$ $y = 2 - 6$ $y = -4$ Point of intersection is $(2; -4)$	✓CA equating both equations ✓CA standard form ✓CA factors Stanmorephysics ✓CA value of x ✓CA value of y (5)
		[19]

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QUESTION 4

4.1	$q = 2$	✓A answer (1)
4.2	 **Do NOT penalise if** point of intersection **is NOT shown**	**Graph of *h*** ✓A shape of h ✓A y-intercept of 3 ✓CA asymptote: $y = 2$ **Graph of g** ✓A x-intercept of $-\frac{3}{4}$ ✓A y-intercept of 3 (5)
4.3	$h(x) = b^x + q$ $h(x) = b^x + 2$ $11 = b^2 + 2$ $b^2 = 9$ $b = 3$	✓CA substitution of q ✓CA substitution of $(2 ; 11)$ ✓CA answer Stanmorephysics.com (3)
4.4.1	$(3 ; 0)$	✓CA answer (1)
4.4.2	$k(x) = 3^{x-1} + 2 - 11$ $k(x) = 3^{x-1} - 9$	✓CA substitution ✓CA answer (2)
		[12]

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QUESTION 5

5.1.1	$A(0\ ;\ 3)$	✓A answer (1)
5.1.2	$n(x)=2x^2-8x+11$ $x=-\frac{b}{2a}$ $x=-\frac{(-8)}{2(2)}$ $x=2$ $n(2)=2(2)^2-8(2)+11$ $y=3$ $\therefore$ Range: $y\in R\ ;\ y\geq 3$ **OR** $y\in[3\ ;\ \infty)$	✓A substitution into equation of axis of symmetry ✓CA corresponding minimum value ✓CA answer (3)
5.1.3	$t(x)=3^{1-n(x)}$ $t(x)=3^{1-3}$ largest value of t is at minimum value of n $t(x)=3^{-2}$ $t(x)=\frac{1}{9}$	✓CA subst. of **minimum value** from 5.1.2 ✓CA answer (2)
5.1.4	$2x^2-8x=2k-11$ $2x^2-8x+11=2k$ $\therefore 3<2k<11$ $\frac{3}{2}<k<\frac{11}{2}$ **OR** $k\in\left(\frac{3}{2}\ ;\ \frac{11}{2}\right)$	✓A rewriting n in terms of k. ✓A CVs of 3 and 11 ✓CA answer (3)
5.1.5	$2x^2-8x+11=dx+9$ $2x^2-8x-dx+2=0$ $2x^2+(-8-d)x+2=0$ $b^2-4ac=0$ $(-8-d)^2-4(2)(2)=0$ $64+16d+d^2-16=0$ $d^2+16d+48=0$ $(d+12)(d+4)=0$ $d=-12$ or $d=-4$	✓A equating equations ✓A standard form ✓A substituting into $b^2-4ac=0$ ✓CA standard form ✓CA both values of d (5)

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5.2	$y=a(x+p)^2+q$ $y=a(x+0)^2+192$ $\frac{551}{5}=a(-20+0)^2+192$ $-\frac{25}{3}=a(-20+0)^2+192$ $-\frac{25}{3}=a(400)$ $a=-\frac{1}{48}$ $y=-\frac{1}{48}(x+0)^2+192$ $0=-\frac{1}{48}x^2$ $-192=-\frac{1}{48}x^2$ $x^2=9216$ $x=\pm 96$ WIDTH $= 96-(-96)$ *OR* $d=\sqrt{(96-(-96))^2+(0-0)^2}$ $=192m$ Width is equal to maximum height	✓A substituting $(0\,;192)$ for $(p\,;q)$ ✓A subst. $\left(-20\,;\frac{551}{3}\right)$ OR $\left(-20\,;183\frac{2}{3}\right)$ for $(x\,;y)$ ✓A value of a ✓ A letting $y=0$ ✓ A $x=\pm 96$ ✓ A subtracting x-intercepts or substituting into distance formula (6)
		[20]

TOTAL MARK : 100

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