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**NATIONAL
SENIOR CERTIFICATE
*NASIONALE
SENIOR SERTIFIKAAT***

GRADE/*GRAAD* 12

SEPTEMBER 2025

**MATHEMATICS P1 MARKING GUIDELINE
*WISKUNDE V1 NASIENRIGLYN***

MARKS/*PUNTE*: 150

This marking guideline consists of 19 pages./
Hierdie nasienriglyn bestaan uit 19 bladsye.



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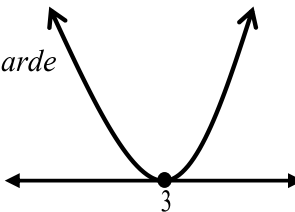
NOTE/LET OP:

- If a candidate answered a question TWICE, mark the FIRST attempt ONLY.
Indien 'n kandidaat 'n vraag TWEE keer beantwoord het, merk SLEGS die EERSTE poging.
- Consistent accuracy(CA) applies in ALL aspects of the marking guideline.
Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die nasienriglyn.
- If a candidate crossed out an attempt of a question and did not redo the question, mark the crossed-out attempt.
Indien 'n kandidaat 'n poging vir 'n vraag deurgetrek het en nie die vraag weer beantwoord het nie, merk die poging wat deurgetrek is.
- The mark for substitution is awarded for substitution into the correct formula.
Die punt vir substitusie word toegeken vir substitusie in die korrekte formule.

QUESTION/VRAAG 1

1.1	1.1.1	$x^2 = 3 - 2x$ $x^2 + 2x - 3 = 0$ $(x+3)(x-1) = 0$ $x+3 = 0$ or/of $x-1 = 0$ $x = -3$ or/of $x = 1$ OR/OF $x^2 + 2x - 3 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(-3)}}{2(1)}$ $x = 1$ or/of $x = -3$	Answers only – Full Marks <i>Slegs antwoorde - Volpunte</i>	✓ standard form/<i>standaardvorm</i> ✓ factors/<i>faktore</i> ✓ both answers/<i>beide antwoorde</i> (3) OR/OF ✓ standard form/<i>standaardvorm</i> ✓ correct substitution into correct formula/ <i>korrekte vervanging in korrekte formule</i> ✓ both answers/<i>beide antwoorde</i> (3)
	1.1.2	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4(3)(2)}}{2(3)}$ $x = \frac{9 \pm \sqrt{57}}{6}$ $\therefore x = 2,76$ or/of $x = 0,24$	Penalise 1 mark for incorrect rounding off./ <i>Penaliseer 1 punt vir verkeerde afronding.</i>	✓ substitution/<i>vervanging</i> ✓✓ <i>x-values/x-waardes</i> (3)



	1.1.3 $9 > -x(x-6)$ $x^2 - 6x + 9 > 0$ $(x-3)^2 > 0$ critical value/kritieke waarde $x = 3$  $x \in \mathbf{R}, x \neq 3$ OR/OF $x \in (-\infty ; -\infty), x \neq 3$	✓ standard form/standaardvorm ✓ critical value/kritieke waarde ✓✓ $x \in \mathbf{R}, x \neq 3$ (accuracy/akkuraatheid) OR/OF ✓✓ $x \in (-\infty ; -\infty), x \neq 3$ (4)
	1.1.4 $(\sqrt{x+5}) = 1 + \sqrt{x}$ $(\sqrt{x+5})^2 = (1 + \sqrt{x})^2$ $x + 5 = 1 + 2\sqrt{x} + x$ $4 = 2\sqrt{x}$ $2 = \sqrt{x}$ $\therefore x = 4$	✓ isolating surd/soleer wortelvorm ✓ square both sides/kwadreer beide kante ✓ simplification/vereenvoudiging ✓ answer/antwoord (4)
1.2	$2x = 1 - y$(1) $y^2 - 2y - 3x + 1 = 3xy - 2x^2$(2) From / Vanaf (1): $y = 1 - 2x$(3) (3) into/in (2): $(1 - 2x)^2 - 2(1 - 2x) - 3x + 1 = 3x(1 - 2x) - 2x^2$ $1 - 4x + 4x^2 - 2 + 4x - 3x + 1 = 3x - 6x^2 - 2x^2$ $12x^2 - 6x = 0$ $6x(2x - 1) = 0$ $x = 0$ or/of $x = \frac{1}{2}$ $y = 1$ or/of $y = 0$ Note: the last mark is an independent mark and can always be awarded as a CA mark Nota: die laaste punt is onafhanklik en kan altyd as 'n CA punt toegeken word.	✓ $y = 1 - 2x$ ✓ substitution/vervanging ✓ standard form/standaardvorm ✓ factors/faktore ✓ x-values/waardes ✓ y-values/waardes (6)



1.3	$\sqrt[3]{k} = 4^{\frac{1}{6}}$ $k^{\frac{1}{3}} = (2^2)^{\frac{1}{6}} = 2^{\frac{1}{3}}$ $\therefore k = 2$ $2 = \frac{1}{x^2 + 7x + 5}$ $x^2 + 7x + 5 = \frac{1}{2} \quad \left(\frac{a}{b} = \frac{c}{d} \Rightarrow \frac{d}{b} = \frac{c}{a} \right)$ $x^2 + 7x + 5 + 2 = \frac{1}{2} + 2 \quad (\text{add 2 both sides/tel 2 beide kante by})$ $x^2 + 7x + 7 = \frac{5}{2}$ $\frac{1}{x^2 + 7x + 7} = \frac{2}{5} \quad (\text{invert fractions/keer breuke om})$ $p = \frac{2}{5}$	✓ surd form to exp. form/ wortelvorm na eks. vorm ✓ $k = 2$ ✓ $x^2 + 7x + 5 = \frac{1}{2}$ ✓ $x^2 + 7x + 7 = \frac{5}{2}$ ✓ $p = \frac{2}{5}$ (5)
		[25]



QUESTION/VRAAG 2			
2.1	2.1.1	Amanda	✓ answer/antwoord (1)
	2.1.2	For a series to converge the ratio (r), $-1 < r < 1$. / <i>Vir 'n reeks om te konvergeer moet verhouding,</i> $-1 < r < 1$ Amanda's r is out of the interval $-1 < r < 1$. / <i>Amanda se r is buite die interval $-1 < r < 1$</i> Formula S_{∞} cannot be used in such a case. / <i>Formule S_{∞} geld nie in so geval nie.</i>	✓ r is out of the interval $r \in (-1; 1)$ / <i>r is buite die interval</i> $r \in (-1; 1)$ ✓ S_{∞} cannot be used in such a case / <i>S_{∞} kan dus nie gebruik word nie</i> (2)
2.2		$\frac{3}{2}(2)^1 + \frac{3}{2}(2)^2 + \frac{3}{2}(2)^3 + \dots + \frac{3}{2}(2)^m$ $3 \quad + 6 \quad + 12 \quad + \dots$ $a = 3$ and/en $r = 2$ $S_n = \frac{a(r^n - 1)}{r - 1}$ $= \frac{3(2^{10} - 1)}{2 - 1}$ $= 3069$	✓ $a = 3$ ✓ $r = 2$ ✓ substitution/vervanging ✓ answer/antwoord (4)
2.3		$T_n = ar^{n-1}$ $\therefore 8\left(\frac{3}{4}\right)^{n-1} < \frac{1}{100}$ $\therefore \left(\frac{3}{4}\right)^{n-1} < \frac{1}{800}$ $\therefore (n-1)\log\left(\frac{3}{4}\right) < \log\left(\frac{1}{800}\right)$ $\therefore n-1 > \frac{\log\left(\frac{1}{800}\right)}{\log\left(\frac{3}{4}\right)} ; \text{since/omdat } \log\left(\frac{3}{4}\right) < 0$ $n-1 > 23,236\dots$ $n > 24,236$ $\therefore 25^{\text{th}}$ term will thus be the first term to be less than $\frac{1}{100}$. / <i>25^{ste} term sal dus die eerste term kleiner as $\frac{1}{100}$ wees.</i>	✓ general term/algemene term ✓ $8\left(\frac{3}{4}\right)^{n-1} < \frac{1}{100}$ ✓ $n-1 > 23,236\dots$ ✓ answer/antwoord (4)
			[11]

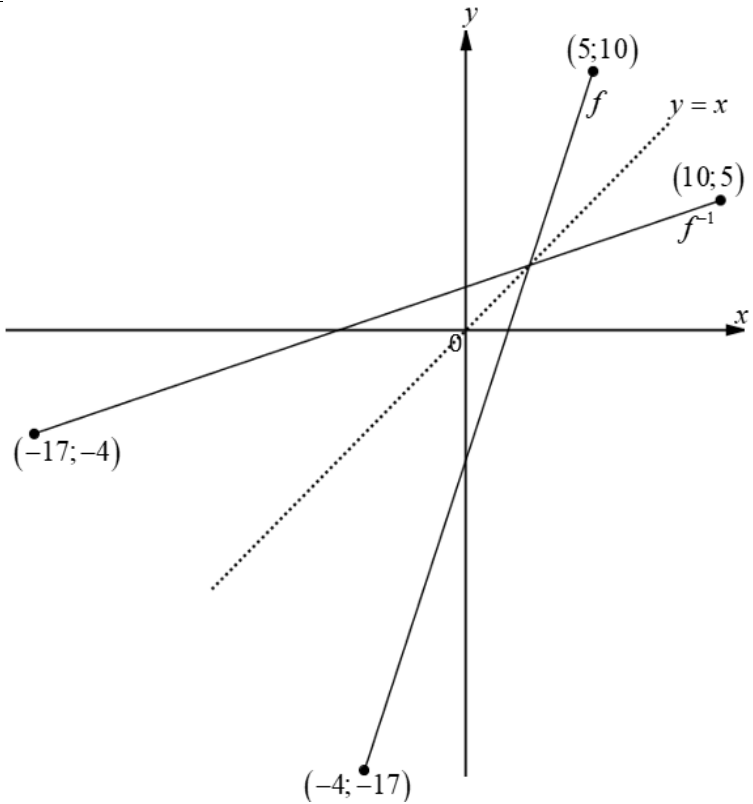


QUESTION/VRAAG 3			
3.1	3.1.1	$2a = 1$ $\therefore a = \frac{1}{2}$ $3a + b = -4$ $3\left(\frac{1}{2}\right) + b = -4$ $b = -\frac{11}{2}$ $T_n = an^2 + bn + c$ $= \frac{1}{2}n^2 - \frac{11}{2}n + c$ $T_4 = 1$ $1 = \frac{1}{2}(4)^2 - \frac{11}{2}(4) + c$ $c = 15$ $T_n = \frac{1}{2}n^2 - \frac{11}{2}n + 15$	✓ 2nd difference/2^{de} verskil = 1 ✓ $a = \frac{1}{2}$ ✓ $b = -\frac{11}{2}$ ✓ $c = 15$ (4)
	3.1.2	$T_{16} = \frac{1}{2}(16)^2 - \frac{11}{2}(16) + 15 = 55$	✓ answer/antwoord (1)
	3.1.3	$-4; -3; -2; \dots$ $a = -4 \quad d = 1$ $T_n = a + d(n-1)$ $= -4 + (n-1)$ $= -4 - 1 + n$ $45 = -5 + n$ $n = 50$ $\therefore$ between/tussen T_{50} and/en T_{51}	✓ sequence of 1st difference/ ry van 1^{ste} verskille ✓ equating/gelykstel ✓ answer/antwoord (3)
3.2	3.2.1	$S_{30} = 2(30)^2 - 6(30)$ $= 1620$	✓ substitution/vervanging ✓ answer/antwoord (2)



	3.2.2	$T_1 = S_1 = 2(1)^2 - 6(1) = -4$ $T_2 = S_2 - S_1 = -4 + 4 = 0$ $T_3 = S_3 - S_2 = 0 + 4 = 4$ $\therefore d = 4$ $\Rightarrow T_n = 4n - 8$ $4n - 8 = 300$ $4n = 308$ $n = 77$ OR/OF $T_n = S_n - S_{n-1}$ $300 = 2n^2 - 6n - 2(n-1)^2 + 6(n-1)$ $300 = 2n^2 - 6n - 2n^2 + 4n - 2 + 6n - 6$ $300 = 4n - 8$ $308 = 4n$ $n = 77$	✓ first 3 terms/<i>eerste 3 terme</i> ✓ general term in terms of n/ <i>algemene term i.t.v. n</i> ✓ value of n/<i>waarde van n</i> (3) OR/OF ✓ substitution/<i>vervanging</i> ✓ general term in terms of n/ <i>algemene term i.t.v. n</i> ✓ value of n/<i>waarde van n</i> (3) [13]
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QUESTION/VRAAG 4		
4.1	$y = 3x - 5$ $x = 3y - 5$ $y = \frac{1}{3}x + \frac{5}{3}, x \in [-17; 10]$	✓ swopping x and y / omruil van x en y ✓ answer/antwoord (accuracy/akkuraatheid) (2)
4.2	$f(5) = 3(5) - 5$ $= 10$	✓ answer / antwoord (1)
4.3		✓ shape of f / vorm van f ✓ shape of f^{-1} / vorm van f^{-1} ✓ endpoints of f / eindpunte van f ✓ endpoints of f^{-1} / eindpunte van f^{-1} (4)
4.4	$f(x) = f^{-1}(x)$ $3x - 5 = \frac{1}{3}x + \frac{5}{3}$ $\frac{8}{3}x = \frac{20}{3}$ $x = \frac{5}{2}$ $\therefore \left(\frac{5}{2}; \frac{5}{2}\right)$ OR / OF $9x - 15 = x + 5$ $8x = 20$ $x = \frac{20}{8}$ $x = \frac{5}{2}$ $y = \frac{5}{2}$	✓ equating f to f^{-1} gelyk stel f aan f^{-1} ✓ $\frac{8}{3}x = \frac{20}{3}$ OR/OF $8x = 20$ ✓ solving of x / oplos vir x ✓ answer/antwoord (4)



4.5	$f(x) = 3x - 5$ $g'(x) = 2ax + b$ $\therefore 2a = 3 \Rightarrow a = \frac{3}{2} \quad \text{and/en} \quad b = -5$ $g(x) = \frac{3}{2}x^2 - 5x + \frac{25}{6}$ $x = \frac{-(-5)}{2\left(\frac{3}{2}\right)} = \frac{5}{3}$ min. value of g / min waarde van $g : g\left(\frac{5}{3}\right) = 0$ Min. value of h / Min.waarde van $h : h(x) = 2^0$ $= 1$	✓ value of a /waarde van a ✓ value of b /waarde van b ✓ $x = \frac{5}{3}$ ✓ min. of $g(x)$ /min. van $g(x)$ ✓ answer/antwoord (5)
		[16]



QUESTION/VRAAG 5		
5.1	$B\left(0; 2\frac{1}{2}\right)$	✓ answer/antwoord (1)
5.2	$y = \frac{a}{x+p} + q$ if vertical asymptote of g is $x = -2$ / <i>as die vertikale asimptoot van g; $x = -2$, is</i> $\therefore p = 2$ $y = \frac{a}{x+2} + q$ substitute/vervang: $(-3; 4)$ $4 = \frac{a}{-3+2} + q$ $4 = -a + q$ $a = q - 4 \dots \dots \dots (1)$ substitute/vervang: $\left(0; -\frac{1}{2}\right)$ $-\frac{1}{2} = \frac{a}{2} + q$ $-1 = a + 2q$ $a = -1 - 2q \dots \dots \dots (2)$ $(1) = (2)$ $q - 4 = -2q - 1$ $-3q = -3$ $q = 1$ For $q = 1$: $a = -3$	✓ value of p / <i>waarde van p</i> ✓ substitution of $(-3; 4)$ / <i>vervang van $(-3; 4)$</i> ✓ formulating the first equation/ <i>formulering van eerste vergelyking</i> ✓ formulating the second equation/ <i>formulering van tweede vergelyking</i> ✓ equating/gelykstelling ✓ values of a and q / <i>waardes van a en q</i> (6)
5.3	$\left\{y \mid y \leq 4\frac{1}{2}; y \in \mathbf{R}\right\}$ OR/OF $y \in \left(-\infty; 4\frac{1}{2}\right]; y \in \mathbf{R}$	✓✓ answer/antwoord (2) OR/OF ✓✓ answer/antwoord (2)



QUESTION/VRAAG 6		
6.1	$A = P(1+i)^n$ $22350 = 8000 \left(1 + \frac{13\%}{4}\right)^{4n}$ $\frac{447}{160} = \left(\frac{413}{400}\right)^n$ $4n = \log_{\left(\frac{413}{400}\right)} \frac{447}{160}$ $4n = 32,12279...$ $n = 8,03 \text{ years/jaar}$	✓ substitution/vervanging ✓ simplification/ vereenvoudiging ✓ correct use of log/korrekte gebruik van 'n log ✓ answer/antwoord (4)
6.2	$F_V = \frac{x \left[(1+i)^n - 1 \right]}{i} + P(1+i)^n$ $= \frac{700 \left[\left(1 + \frac{12\%}{12}\right)^{180} - 1 \right]}{\frac{12\%}{12}} + 5200 \left(1 + \frac{12\%}{12}\right)^{120}$ $= R366\,868,15$ OR/OF $F_V = \left[\frac{700 \left[\left(1 + \frac{12\%}{12}\right)^{60} - 1 \right]}{\frac{12\%}{12}} + 5200 \right] \left(1 + \frac{12\%}{12}\right)^{120} + \frac{700 \left[\left(1 + \frac{12\%}{12}\right)^{120} - 1 \right]}{\frac{12\%}{12}}$ $= 205841,0675 + 161027,0826$ $= R366\,868,15$	✓ i and/en $n=180$ ✓ $n=120$ ✓ correct substitution into F_V / korrekte vervanging in F_V ✓ correct substitution into A / korrekte vevanging in A ✓ answer/antwoord (5) OR/OF ✓ i and/en 60 in F_V ✓ adding/optel 5200 and/en $\left(1 + \frac{12\%}{12}\right)^{120}$ ✓ second/tweede F_V ✓ 205841,0675 + 161027,0826 ✓ answer/Antwoord (5)



6.3	6.3.1	$P_v = \frac{[1 - (1+i)^{-n}]}{i}$ $900000 \left(1 + \frac{11,5\%}{12}\right)^3 = \frac{x \left[1 - \left(1 + \frac{11,5}{12}\right)^{-237}\right]}{\frac{11,5\%}{12}}$ $x = \frac{900000 \left(1 + \frac{11,5\%}{12}\right)^3 \times \frac{11,5\%}{12}}{\left[1 - \left(1 + \frac{11,5}{12}\right)^{-237}\right]}$ $x = R9908,90$	✓ $n = -237$ ✓ $900000 \left(1 + \frac{11,5\%}{12}\right)^3$ ✓ correct substitution/ korrekte vervanging ✓ answer/antwoord (4)
	6.3.2	Total paid in the 16 years/<i>Totaal betaal in die 16 jaar</i> $= R9908,90 \times 189 = R1\,872\,782,10$ Interest paid/<i>Rente betaal</i> $= R1\,872\,782,10 - (R900\,000 - R379\,811,29)$ $= R1\,352\,593,39$	✓ R1 872 782,10 ✓ subtracting (.....)/ aftrekking van (.....) ✓ answer/antwoord (3)
			[16]

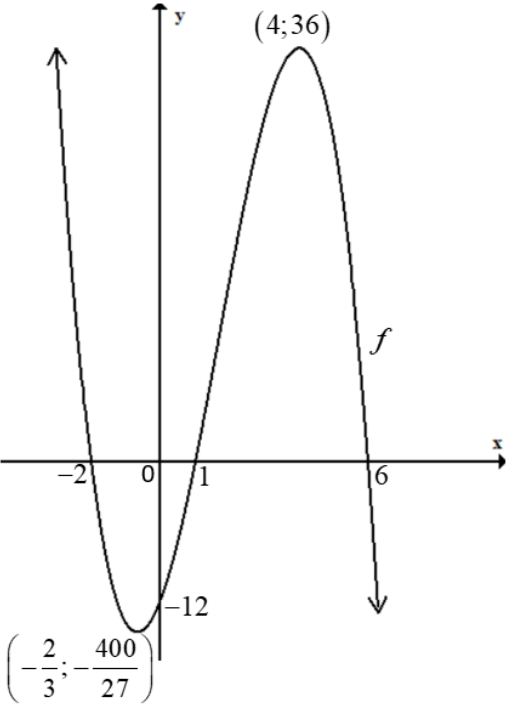


QUESTION/VRAAG 7		
7.1	$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{(x+h)^2 + 2 - (x^2 + 2)}{h}$ $= \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 + 2 - x^2 - 2}{h}$ $= \lim_{h \rightarrow 0} \frac{2xh + h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(2x + h)}{h}$ $= 2x$	Penalise 1 mark for incorrect notation in this question <i>Penaliseer 1 punt vir verkeerde notasie in hierdie vraag</i> Answer ONLY: 0 marks <i>SLEGS antwoord: 0 punte</i> ✓ substitution/vervanging ✓ simplification/vereenvoudiging ✓ factorisation/faktorisering (dividing by h/deel deur h) ✓ answer/antwoord (4)
7.2	7.2.1 $f(x) = (5x - 7)(5x + 7)$ $= 25x^2 - 49$ $f'(x) = 50x$	✓ $25x^2 - 49$ ✓ $50x$ (2)
	7.2.2 $p'(x) = 2x^3$ $D_x \left[p(x) - \sqrt[3]{x} + \frac{5}{x^4} \right]$ $= D_x \left[p(x) - x^{\frac{1}{3}} + 5x^{-4} \right]$ $= p'(x) - \frac{1}{3}x^{-\frac{2}{3}} - 20x^{-5}$ $= 2x^3 - \frac{1}{3}x^{-\frac{2}{3}} - 20x^{-5}$	✓ $x^{\frac{1}{3}} + 5x^{-4}$ ✓ $2x^3$ ✓ $\frac{1}{3}x^{-\frac{2}{3}}$ ✓ $-20x^{-5}$ (4)
[10]		



QUESTION/VRAAG 8		
8.1	8.1.1	$f(x) = -x^3 + 5x + 8x - 12$ $y - \text{int.} / \text{afsnit} : y = -12$ $x - \text{int s.} / x - \text{afsnitte} : y = 0 :$ $(x+2)(x-1)(x-6) = 0$ $x = -2 \text{ or / of } x = 1 \text{ or / of } x = 6$ $(-2; 0) ; (1; 0) ; (6; 0)$
		✓ y-intercept/y-afsnit ✓ first factor/eerste faktor ✓ other two factors/ander twee faktore ✓ x-intercepts/x-afsnitte (4)
	8.1.2	$f(x) = -x^3 + 5x + 8x - 12$ $f'(x) = -3x^2 + 10x + 8$ $f'(x) = 0$ $-3x^2 + 10x + 8 = 0$ $(x-4)(3x+2) = 0$ $x = 4 \text{ or/of } x = -\frac{2}{3}$ $f(4) = 36$ $f\left(-\frac{2}{3}\right) = -\frac{400}{27} \approx -14,81$ $(4; 36) \left(-\frac{2}{3}; -\frac{400}{27}\right)$ OR / OF $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(10) \pm \sqrt{(10)^2 - 4(-3)(8)}}{2(-3)}$ $x = -\frac{2}{3} \text{ or/of } x = 4$ $f(4) = 36$ $f\left(-\frac{2}{3}\right) = -\frac{400}{27} \approx -14,81$ $(4; 36) \left(-\frac{2}{3}; -\frac{400}{27}\right)$
		✓ $f'(x)$ ✓ $f'(x) = 0$ ✓ x – values /x-waardes ✓ y – values /y-waardes (4)
		OR/OF ✓ $f'(x)$ ✓ $f'(x) = 0$ ✓ x – values /x-waardes ✓ y – values /y-waardes (4)



	8.13		✓ <i>x</i>-intercepts/<i>x</i>-afsnitte ✓ <i>y</i>-intercept/<i>y</i>-afsnit ✓ turning points/<i>draaipunte</i> ✓ shape/<i>vorm</i>	(3)
8.2	8.2.1	$f'(x) = 3kx^2 + 2px + 4$ $f''(x) = 6kx + 2p$ $g(x) = -6x + 10$ $\therefore 6k = -6$ and/en $2p = 10$ $k = -1$ and/en $p = 5$	✓ $f''(x) = 6kx + 2p$ ✓ $p = 5$ ✓ $k = -1$	(3)
	8.2.2	x – coordinate of inflection point: x – <i>koördinaat van buigpunt</i> : $-6x + 10 = 0$ $x = \frac{5}{3}$ and/en $a < 0$ $\therefore f$ is concave up when: / f is <i>konkaaf</i> op vir: $x < \frac{5}{3}$ OR/OR f is concave up when: / f is <i>konkaaf</i> op wanneer: $f''(x) > 0$ $-6x + 10 > 0$ $-6x > -10$ $x < \frac{5}{3}$	✓ $f''(x) = 0$ ✓ answer /<i>antwoord</i> OR/OF ✓ $f''(x) > 0$ ✓ answer /<i>antwoord</i>	(2)
				[16]



QUESTION/VRAAG 9		
9	$x + y = 25$ let the expression to be minimised be A: <i>laat A die uitdrukking wees wat ge - minimeer moet word</i> $\therefore A = x^2 + 3y^2$ but/maar: $y = 25 - x$ $A = x^2 + 3(25 - x)^2$ $= x^2 + 3(625 - 50x + x^2)$ $= x^2 + 1875 - 150x + 3x^2$ $= 4x^2 - 150x + 1875$ $A'(x) = 8x^2 - 150$ $A'(x) = 0$ $150 = 8x^2$ $x = \frac{75}{4}$ $y = \frac{25}{4}$	$\checkmark x^2 + 3y^2$ $\checkmark y = 25 - x$ $\checkmark x^2 + 3(25 - x)^2$ $\checkmark A'(x)$ $\checkmark A'(x) = 0$ $\checkmark x = \frac{75}{4}$ $\checkmark y = \frac{25}{4}$
		(7)
		[7]



QUESTION/VRAAG 10			
10.1	10.1.1	$P(B) = 1 - P(\text{not/nie } B)$ $= 1 - 0,7$ $= 0,3$	✓ substitution/vervanging ✓ answer/antwoord (2)
	10.1.2	$P(A \text{ and/en } B) = 0$ $P(A \text{ or/of } B) = P(A) + P(B)$ $P(A \text{ or/of } B) = 0,5 + 0,3$ $= 0,8$ $\therefore P[\text{not/nie}(A \text{ or/of } B)] = 0,2$	✓ $P(A \text{ and/en } B) = 0$ ✓ substitution into the correct rule/ <i>vervanging in korrekte reël</i> ✓ answer/antwoord (3)
10.2	10.2.1	$y = 1 - \frac{9}{10}$ $= 0,1$ $= \frac{1}{10}$ $x = \frac{9}{10} - \left(\frac{13}{30} + \frac{1}{15} + \frac{1}{75} + \frac{2}{15} + \frac{1}{30} + \frac{1}{50} \right)$ $= \frac{1}{5}$	✓ value of y /waarde van y ✓ sum of at least 3/som van ten minste 3 $= \frac{9}{10}$ ✓ value of x /waarde van x (3)
	10.2.2	$P(\text{cellphone and tablet}) = \frac{4}{15}$ $P(\text{selfoon en tablet}) = \frac{4}{15}$	✓ answer/antwoord (1)
	10.2.3	$P(E) = \frac{n(E)}{n(S)}$ $\frac{1}{50} = \frac{n(E)}{150}$ $n(E) = 3$ $\therefore \text{only 3 learners owning laptops/}$ $\text{slegs 3 leerders besit skootrekenaars}$	✓ $n(E) = \frac{1}{50} \times 150$ ✓ answer/antwoord (2)
			[11]



QUESTION/VRAAG 11		
11.1	Case 1 (1 letter) : $26 \times 10 \times 10 = 2\,600$ But the letter can be in any of three positions $\therefore 3 \times 2\,600 = 7\,800$ codes Case 2 (2 letter codes) : $26 \times 26 \times 10 = 6\,760$ But the digit can be in any of three different positions $\therefore 3 \times 6\,760 = 20\,280$ codes Case 3 (3 letter codes) : $26 \times 26 \times 26 = 17\,576$ codes $\Rightarrow$ Total number of codes = 45 656 codes	Accuracy/Akkuraatheid ✓ 7 800 answer/antwoord ✓ 20 280 answer/antwoord ✓ 17 576 answer/antwoord ✓ answer/antwoord (4)
	Opsie 1 (1 letter) : $26 \times 10 \times 10 = 2\,600$ <i>Maar die letter kan in enige van drie posisies wees</i> $\therefore 3 \times 2\,600 = 7\,800$ kodes Opsie 2 (2 letter kodes) : $26 \times 26 \times 10 = 6\,760$ <i>Maar die syfer kan in enige van drie posisies wees</i> $\therefore 3 \times 6\,760 = 20\,280$ kodes Opsie 3 (3 letter kodes) : $26 \times 26 \times 26 = 17\,576$ kodes $\Rightarrow$ Totale aantal kodes = 45 656 kodes	
11.2	$P(\text{Letter, Even Code}) / P(\text{Letter, Ewe kode}) = \frac{250}{45\,656}$	✓ answer / antwoord (1)
		[5]
		TOTAL/TOTAAL: 150

