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Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE
NASIONALE SENIOR SERTIFIKAAT

GRADE/*GRAAD* 12

SEPTEMBER 2025

MATHEMATICS P1 MARKING GUIDELINE
WISKUNDE V1 NASIENRIGLYN

MARKS/*PUNTE*: **150**

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

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NOTE/*LET OP*:

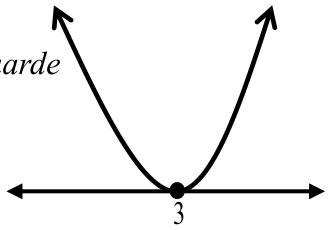
- If a candidate answered a question TWICE, mark the FIRST attempt ONLY.
  Indien 'n kandidaat 'n vraag TWEE keer beantwoord het, merk SLEGS die EERSTE poging.
- Consistent accuracy(CA) applies in ALL aspects of the marking guideline.
  Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die nasienriglyn.
- 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 *Slegs antwoorde - Volpunte*	✓ standard form/*standaardvorm* ✓ factors/*faktore* ✓ both answers/*beide antwoorde* (3) **OR/*OF*** ✓ standard form/*standaardvorm* ✓ correct substitution into correct formula/ *korrekte vervanging in korrekte formule* ✓ both answers/*beide antwoorde* (3)
	1.1.2	$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ $x = \frac{-(-9) \pm \sqrt{(-9)^2-4(3)(2)}}{2(3)}$ $x = \frac{9 \pm \sqrt{57}}{6}$ Penalise 1 mark for incorrect rounding off./ *Penaliseer 1 punt vir verkeerde afronding.* $\therefore x = 2,76$ or/*of* $x = 0,24$	✓ substitution/*vervanging* ✓✓ *x*-values/*x-waardes* (3)

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	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	$\left(\sqrt{x+5}\right) = 1 + \sqrt{x}$ $\left(\sqrt{x+5}\right)^2 = \left(1+\sqrt{x}\right)^2$ $x + 5 = 1 + 2\sqrt{x} + x$ $4 = 2\sqrt{x}$ $2 = \sqrt{x}$ $\therefore x = 4$	✓ isolating surd/*isoleer 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)

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

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

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QUESTION/*VRAAG* 3			
3.1	3.1.1	$2a=1 \qquad 3a+b=-4$ $\therefore a=\frac{1}{2} \qquad 3\left(\frac{1}{2}\right)+b=-4$ $b=-\frac{11}{2}$ $T_n=an^2+bn+c$ $=\frac{1}{2}n^2-\frac{11}{2}n+c$ $T_4=1$ $1=\frac{1}{2}(4)^2-\frac{11}{2}(4)+c$ $c=15$ $T_n=\frac{1}{2}n^2-\frac{11}{2}n+15$	✓ 2^{nd} 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	$-4;-3;-2;\ldots$ $a=-4 \quad d=1$ $T_n=a+d(n-1)$ $=-4+(n-1)$ $=-4-1+n$ $45=-5+n$ $n=50$ $\therefore$ between/*tussen* T_{50} and/*en* T_{51}	✓ sequence of 1^{st} 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)

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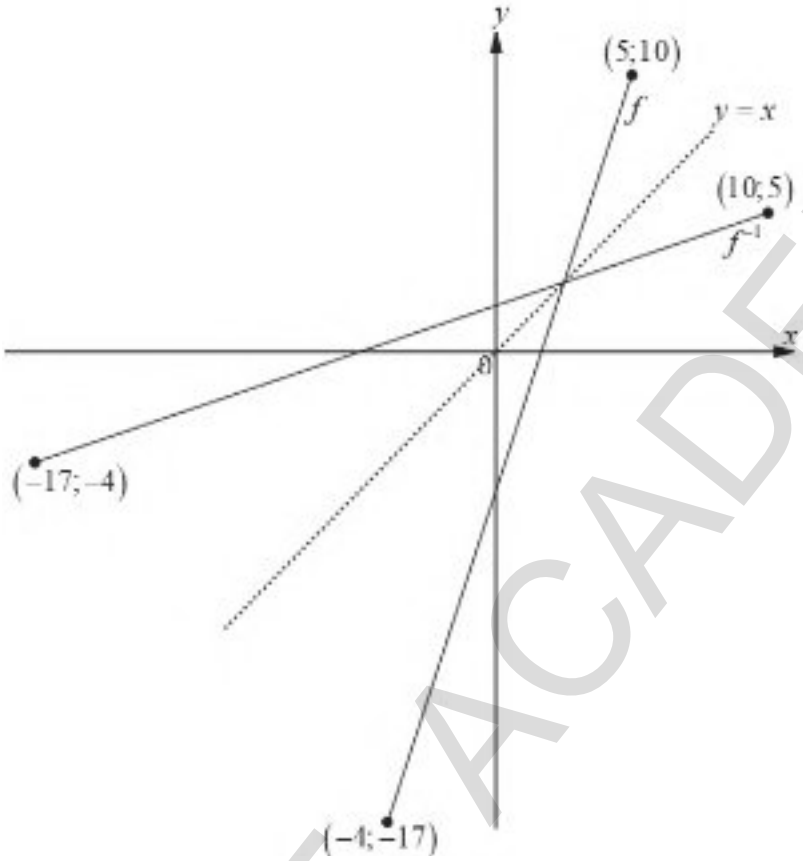
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	3.2.2	$T_1 = S_1 = 2(1)^2 - 6(1) = -4$ $T_2 = S_2 - S_1 = -4 + 4 = 0$ $T_3 = S_3 - S_2 = 0 + 4 = 4$ $\therefore d = 4$ $\Rightarrow T_n = 4n - 8$ $4n - 8 = 300$ $4n = 308$ $n = 77$ **OR/*OF*** $T_n = S_n - S_{n-1}$ $300 = 2n^2 - 6n - 2(n-1)^2 + 6(n-1)$ $300 = 2n^2 - 6n - 2n^2 + 4n - 2 + 6n - 6$ $300 = 4n - 8$ $308 = 4n$ $n = 77$	✓ first 3 terms/*eerste 3 terme* ✓ general term in terms of *n*/ *algemene term i.t.v. n* ✓ value of *n*/*waarde van n* (3) **OR/*OF*** ✓ substitution/*vervanging* ✓ general term in terms of *n*/ *algemene term i.t.v. n* ✓ value of *n*/*waarde van n* (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)

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4.5	$f(x)=3x-5$ $g'(x)=2ax+b$ $\therefore 2a=3 \Rightarrow a=\frac{3}{2}$ and/*en* $b=-5$ $g(x)=\frac{3}{2}x^2-5x+\frac{25}{6}$ $x=\frac{-(-5)}{2\left(\frac{3}{2}\right)}=\frac{5}{3}$ 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]

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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 $x=-2$ / *as die vertikale asimptoot van* g ; $x=-2$, *is* $\therefore p=2$ $y=\frac{a}{x+2}+q$ substitute/*vervang*: $(-3;4)$ $4=\frac{a}{-3+2}+q$ $4=-a+q$ $a=q-4$.....(1) substitute/*vervang*: $\left(0;-\frac{1}{2}\right)$ $-\frac{1}{2}=\frac{a}{2}+q$ $-1=a+2q$ $a=-1-2q$.....(2) $(1)=(2)$ $q-4=-2q-1$ $-3q=-3$ $q=1$ For $q=1: a=-3$	✓ value of p /*waarde van p* ✓ substitution of $(-3;4)$ / *vervanging van* $(-3;4)$ ✓ formulating the first equation/ *formulering van eerste vergelyking* ✓ formulating the second equation/ *formulering van tweede vergelyking* ✓ equating/*gelykstelling* ✓ values of a and q / *waardes van* a *en* q (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)

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5.4	$y=-(x+2)+1$ $=-x-1$ **OR/*OF*** $y=-x+c$ subst./*vervang* : $(-2;1)$ $1=-(-2)+c$ $c=-1$ $y=-x-1$		✓ substitution/*vervanging* ✓ answer/*antwoord* **OR/*OF*** ✓ substitution/*vervanging* ✓ answer/*antwoord* (2)
5.5	$B\left(0;\frac{5}{2}\right)$ $C(x;0)$ $x_C=1$(by using symmetry / *deur simmetrie te gebruik*) **OR / *OF*** $-1=-\frac{3}{x+2}$ $-x-2=-3$ $x=3-2$ $x=1$ $C(1;0)$ $m=\frac{\frac{5}{2}-0}{0-1}$ $=-\frac{5}{2}$		✓ coordinates of C/*koördinate van C* ✓ substitution/*vervanging* ✓ answer/*antwoord* (3)
5.6	5.6.1	$-5\le x\le 1$	✓✓ answer/*antwoord* (2)
	5.6.2	$x<-2$ or / *of* $x>1$	✓✓ answer/*antwoord* (2)
5.7	$k<\frac{5}{2}$		✓✓ answer/*antwoord* (2)
			[20]

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QUESTION/*VRAAG* 6		
6.1	$A = P(1+i)^n$ $22350 = 8000\left(1+\frac{13\%}{4}\right)^{4n}$ $\frac{447}{160} = \left(\frac{413}{400}\right)^n$ $4n = \log_{\left(\frac{413}{400}\right)} \frac{447}{160}$ $4n = 32,12279...$ $n = 8,03$ 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)

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6.3	6.3.1	$P_V = \frac{\left[1-(1+i)^{-n}\right]}{i}$ $900000\left(1+\frac{11,5\%}{12}\right)^3 = \frac{x\left[1-\left(1+\frac{11,5}{12}\right)^{-237}\right]}{\frac{11,5\%}{12}}$ $x = \frac{900000\left(1+\frac{11,5\%}{12}\right)^3 \times \frac{11,5\%}{12}}{\left[1-\left(1+\frac{11,5}{12}\right)^{-237}\right]}$ $x = R9\,908,90$	✓ $n = -237$ ✓ $900000\left(1+\frac{11,5\%}{12}\right)^3$ ✓ correct substitution/ *korrekte vervanging* ✓ answer/*antwoord* (4)
	6.3.2	Total paid in the 16 years/*Totaal betaal in die 16 jaar* $= R9908,90 \times 189 = R1\,872\,782,10$ Interest paid/*Rente betaal* $= R1872\,782,10 - (R900\,000 - R379\,811,29)$ $= R1\,352\,593,39$	✓ R1 872 782,10 ✓ subtracting (……..)/ *aftrekking van (……..)* ✓ answer/*antwoord* (3)
			[16]

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QUESTION/*VRAAG* 7			
7.1	$f'(x)=\lim\limits_{h\to 0}\dfrac{f(x+h)-f(x)}{h}$ $=\lim\limits_{h\to 0}\dfrac{(x+h)^2+2-(x^2+2)}{h}$ $=\lim\limits_{h\to 0}\dfrac{x^2+2xh+h^2+2-x^2-2}{h}$ $=\lim\limits_{h\to 0}\dfrac{2xh+h^2}{h}$ $=\lim\limits_{h\to 0}\dfrac{h(2x+h)}{h}$ $=2x$	Penalise 1 mark for incorrect notation in this question *Penaliseer 1 punt vir verkeerde notasie in hierdie vraag* Answer ONLY: 0 marks *SLEGS antwoord*: 0 *punte*	✓ 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	$p'(x)=2x^3$ $D_x\left[p(x)-\sqrt[3]{x}+\dfrac{5}{x^4}\right]$ $=D_x\left[p(x)-x^{\frac{1}{3}}+5x^{-4}\right]$ $=p'(x)-\dfrac{1}{3}x^{-\frac{2}{3}}-20x^{-5}$ $=2x^3-\dfrac{1}{3}x^{-\frac{2}{3}}-20x^{-5}$	✓ $x^{\frac{1}{3}}+5x^{-4}$ ✓ $2x^3$ ✓ $\dfrac{1}{3}x^{-\frac{2}{3}}$ ✓ $-20x^{-5}$ (4)
			[10]

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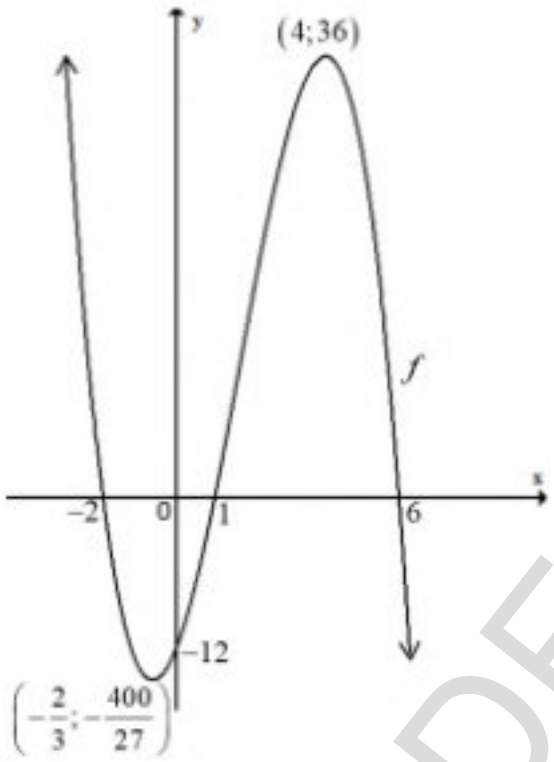
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QUESTION/*VRAAG* 8			
8.1	8.1.1	$f(x)=-x^3+5x+8x-12$ $y-\text{int.}/\textit{afsnit}: y=-12$ $x-\text{int}s./\ x-\textit{afsnitte}: y=0:$ $(x+2)(x-1)(x-6)=0$ $x=-2$ or/*of* $x=1$ or/*of* $x=6$ $(-2;0)\ ;(1;0)\ ;(6;0)$	✓ y-intercept/*y-afsnit* ✓ first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

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	8.13		✓ *x*-intercepts/*x-afsnitte* *y*-intercept/*y-afsnit* ✓ turning points/*draaipunte* ✓ shape/*vorm* (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: $x-$*koördinaat van buigpunt* : $-6x+10=0$ $x=\frac{5}{3}$ and/*en* $a<0$ $\therefore f$ is concave up when: / f *is konkaaf op vir*: $x<\frac{5}{3}$ **OR/*OR*** f is concave up when:/ f *is konkaaf op* wanneer: $f''(x)>0$ $-6x+10>0$ $-6x>-10$ $x<\frac{5}{3}$	✓ $f''(x)=0$ ✓ answer /*antwoord* **OR/*OF*** ✓ $f''(x)>0$ ✓ answer /*antwoord* (2)
			[16]

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

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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/ *vervanging in korrekte reël* ✓ 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	$P(\text{cellphone and tablet}) = \frac{4}{15}$ $P(\textit{selfoon en tablet}) = \frac{4}{15}$	✓ answer/*antwoord* (1)
	10.2.3	$P(E) = \frac{n(E)}{n(S)}$ $\frac{1}{50} = \frac{n(E)}{150}$ $n(E) = 3$ $\therefore$ only 3 learners owning laptops/ *slegs 3 leerders besit skootrekenaars*	✓ $n(E) = \frac{1}{50} \times 150$ ✓ answer/*antwoord* (2)
			[11]

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QUESTION/*VRAAG* 11		
11.1	**Case 1 (1 letter)** : $26\times10\times10=2\,600$ But the letter can be in any of three positions $\therefore\ 3\times2\,600=7\,800$ codes **Case 2 (2 letter codes)** : $26\times26\times10=6\,760$ But the digit can be in any of three different positions $\therefore 3\times6\,760=20\,280$ codes **Case 3 (3 letter codes)** : $26\times26\times26=17\,576$ 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) : $26\times10\times10=2\,600$ *Maar die letter kan in enige van drie posisies wees* $\therefore\ 3\times2\,600=7\,800$ kodes ***Opsie 2 (2 letter kodes)*** : $26\times26\times10=6\,760$ *Maar die syfer kan in enige van drie posisies wees* $\therefore 3\times6\,760=20\,280$ codes ***Opsie 3 (3 letter kodes)*** : $26\times26\times26=17\,576$ kodes $\Rightarrow$ *Totale aantal kodes* = ***45 656 kodes***	
11.2	P(Letter, Even Code) / P(*Letter, Ewe kode*) = $\frac{250}{45\,656}$	✓ answer / *antwoord* (1)
		[5]
		TOTAL/*TOTAAL*: 150

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