NATIONAL
SENIOR CERTIFICATE /
NASIONALE
SENIOR SERTIFIKAAT

GRADE/*GRAAD* 12

JUNE/*JUNIE* 2024

MATHEMATICS P1 MARKING GUIDELINE/
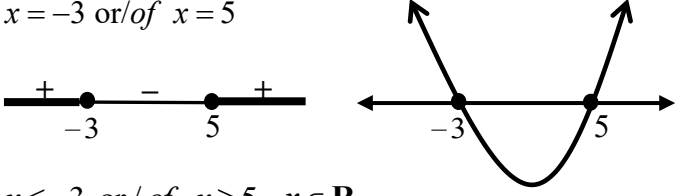# *WISKUNDE V1 NASIENRIGLYN*

MARKS/*PUNTE*: 150

This marking guideline consists of 17 pages./
Hierdie nasienriglyn bestaan uit 17 *bladsye*.

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 memorandum.
  Volgehoue akkuraatheid geld deurgaans in ALLE aspekte van die memorandum.
- 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 1/*VRAAG 1*

1.1.1	$x^2 - 8(x-2) = 25$ $x^2 - 8x + 16 - 25 = 0$ $x^2 - 8x - 9 = 0$ $(x+1)(x-9) = 0$ $x+1 = 0$ or/*of* $x-9 = 0$ $x = -1$ or/*of* $x = 9$ **OR / *OF*** $x^2 - 8x - 9 = 0$ Answers only – Full marks *Slegs antwoorde – Volpunte* $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \dfrac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(-9)}}{2(1)}$ $= \dfrac{8 \pm \sqrt{100}}{2}$ $x = -1$ or / *of* $x = 9$	✓ 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	Penalise 1 mark for incorrect rounding off./ *Penaliseer 1 punt vir verkeerde afronding.* $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \dfrac{-(2) \pm \sqrt{(2)^2 - 4(-3)(2)}}{2(-3)}$ $x = \dfrac{-2 \pm \sqrt{28}}{-6}$ $\therefore x = -0,55$ or / *of* $x = 1,22$	 ✓ substitution / *vervanging* ✓✓ x-values / *x–waardes* (3)

1.1.3	$(x+3)(5-x) \leq 0$ $(x+3)(x-5) \geq 0$ critical values/*kritieke waardes* $x = -3$ or/*of* $x = 5$ $x \leq -3$ or / *of* $x \geq 5$, $x \in \mathbf{R}$ **OR/*OF*** $x \in (-\infty \,;\, -3]$ or / *of* $x \in [5 \,;\, \infty)$, $x \in \mathbf{R}$	✓ critical values / *kritieke waardes* ✓✓ $x \leq -3$ or / *of* $x \geq 5$, $x \in \mathbf{R}$ (accuracy / *akkuraatheid*) **OR/*OF*** $x \in (-\infty \,;\, -3]$ or / *of* $x \in [5 \,;\, \infty)$, $x \in \mathbf{R}$ (3)
1.1.4 (a)	$x \leq -5, x \in \mathbb{R}$	✓✓ answer / *antwoord* (2)
1.1.4 (b)	$x + 3 = \sqrt{x+5}$ $(x+3)^2 = (\sqrt{x+5})^2$ $x^2 + 6x + 9 = x + 5$ $x^2 + 5x + 4 = 0$ $(x+1)(x+4) = 0$ $\therefore x = -1$ or / *of* $x \neq -4$	✓ isolating surd / *isoleer wortelvorm* ✓ square both sides / *kwadreer beide kante* ✓ standard form / *standaardvorm* ✓ selection / keuse (4)

1.2		
	$y + 2x = 5$ ....(1)	
	$2x^2 - xy - 4y^2 = 8$ ....(2)	
	From / *Vanaf* (1): $y = -2x + 5$ ....(3)	✓ $y = -2x + 3$
	(3) into/*in* (2):	
	$2x^2 - x(-2x+5) - 4(-2x+5)^2 = 8$	✓ substitution / *vervanging*
	$2x^2 - x(-2x+5) - 4(4x^2 - 20x + 25) - 8 = 0$	
	$2x^2 + 2x^2 - 5x - 16x^2 + 80x - 100 - 8 = 0$	
	$-12x^2 + 75x - 108 = 0$	
	$4x^2 - 25x + 36 = 0$	✓ standard form / *standaardvorm*
	$(4x-9)(x-4) = 0$	✓ factors / *faktore*
	$x = \dfrac{9}{4}$ or/*of* $x = 4$	
		✓ x-values / *waardes*
	$y = \dfrac{1}{2}$ or/*of* $y = -3$	✓ y-values / *waardes*
		(6)
1.3	For M to be a maximum, the denominator must be a minimum. *Vir M om 'n maksimum te wees, moet die noemer 'n minimum wees.*	✓ denominator to be minimum / *noemer moet minimum wees*
	Min. value of denominator is at $x = \dfrac{-b}{2a} = \dfrac{-(-4)}{2(1)} = 2$	✓ value of x for minimum denominator / *waarde van x vir minimum noemer*
	Min. value / *waarde* $= (2)^2 - 4(2) + 8 = 4$	✓ minimum value / *minimumwaarde*
	$\therefore$ *Max. value of* / *Maks. waarde van*: $M = \dfrac{108}{4} = 27$	✓ answer / *antwoord*
		(4)
		[25]

QUESTION 2/*VRAAG 2*

2.1.1	$T_{43} = a + 42d$ $= 2 + 42(-5)$ $= -208$	✓ value of d / *waarde van d* ✓ substitution / *vervanging* ✓ answer / *antwoord* (3)
2.1.2	$S_n = \dfrac{n}{2}[a + l]$　　　　　　　$S_n = \dfrac{n}{2}[2a + (n-1)d]$ $S_{43} = \dfrac{43}{2}[2 + (-208)]$ **OR /*OF*** $S_{43} = \dfrac{43}{2}[2(2) + (43-1)(-5)]$ $\qquad = -4\,429 \qquad\qquad\qquad\qquad\qquad = -4\,429$	✓ substitution / *vervanging* ✓ answer / *antwoord* (2)
2.1.3	$T_n = -5n + 7 = -2023$ $\qquad\quad -5n = -2030$ $\qquad\qquad\; n = 406$	✓ general term / *algemene term* ✓ equating to –2030 / *gelykstel aan –2030* ✓ answer / *antwoord* (3)
2.2.1	$r = \dfrac{2(3x-1)^2}{2(3x-1)} = 3x - 1$ For convergence / *Vir konvergensie*: $-1 < r < 1$ $\therefore\; -1 < 3x - 1 < 1$ $\qquad 0 < 3x < 2$ $\qquad 0 < x < \tfrac{2}{3}$	✓ value r i.t.o x / *waarde van r i.t.v x* ✓ substitution / *vervanging* ✓ answer / *antwoord* (3)
2.2.2	$T_1 = 2\big(3(\tfrac{1}{2}) - 1\big)^1 = 1$ $T_2 = 2\big(3(\tfrac{1}{2}) - 1\big)^2 = \dfrac{1}{2} \qquad \Rightarrow \quad r = \dfrac{1}{2}$ $T_3 = 2\big(3(\tfrac{1}{2}) - 1\big)^3 = \dfrac{1}{4}$ $S_\infty = \dfrac{a}{1-r}$ $\qquad = \dfrac{1}{1 - \frac{1}{2}}$ $\qquad = 2$	✓ first 3 terms and r / *eerste 3 terme en r* ✓ substitution / *vervanging* ✓ answer / *antwoord* (3)

2.3	$a + ar + ar^2 = 21$ ....(1)	✓ equations 1 and 2 / vergelykings 1 en 2
	$a \times ar \times ar^2 = 64$...........(2)	
	$(ar)^3 = (4)^3$	
	$ar = 4$	
	$a = \dfrac{4}{r}$............(3)	✓ $a = \dfrac{4}{r}$
	(3) into/in (1):	
	$\dfrac{4}{r} + \dfrac{4}{r} \times r + \dfrac{4}{r} \times r^2 = 21$	✓ substitution / vervanging
	$4r^2 - 17r + 4 = 0$	
	$(4r - 1)(r - 4) = 0$	
	$r = \frac{1}{4}$ or / of $r = 4$	✓ answer / antwoord
	$\Rightarrow a = 1$	
		(4)
		[18]

QUESTION 3/*VRAAG 3*

3.1	**3**　　　**;**　　　**12**　　　**;**　　　**33**　　　**;**　　　**. . .** 　　　　**9**　　　**;**　　　**21**　　　**;**　　　**33** 　　　　　　　　**12**　　　**;**　　　*12* $T_4 = 66$	✓ answer / *antwoord* (1)
3.2	$2a = 12$　　　$3(6) + b = 9$　　　$6 - 9 + c = 3$ 　$a = 6$　　　　　　$b = -9$　　　　　$c = 6$ $T_n = 6n^2 - 9n + 6$	✓ $a = 6$ ✓ $b = -9$ ✓ $c = 6$ (3)
3.3	$t_n = 12n - 3 = 345$ 　　　　$12n = 348$ 　　　　　$n = 29$ $\Rightarrow T_{29}$ & T_{30} **OR /** *OF* $T_{n+1} - T_n = 345$ $6(n+1)^2 - 9(n+1) + 6 - 6n^2 + 9n - 6 = 345$ $6n^2 + 12n + 6 - 9n - 9 + 6 - 6n^2 + 9n - 6 - 345 = 0$ $12n - 348 = 0$ $12n = 348$ $n = 29$ $\Rightarrow T_{29}$ & T_{30} **OR /** *OF* by inspection: / *deur inspeksie* : $T_{30} = 6(30)^2 - 9(30) + 6 = 5136$ $T_{29} = 6(29)^2 - 9(29) + 6 = 4791$ $T_{30} - T_{29} = 5136 - 4791 = 345$	✓ equating / *gelykstel* ✓ value of *n* / *waarde van n* ✓ answer / *antwoord* **OR /** *OF* ✓ substitution / *vervanging* ✓ expanding / *uitbreiding* ✓ answer / *antwoord* **OR /** *OF* ✓ $T_{30} = 5136$ ✓ $T_{29} = 4791$ ✓ $T_{30} - T_{29} = 345$ (3)
		[7]

QUESTION 4/_VRAAG 4_

4.1	$D(-2;-8)$	✓ answer / _antwoord_ (1)
4.2	$x = -2$ _and_ $y = 1$	✓ $x = -2$ and/_en_ ✓ $y = 1$ (2)
4.3.1	$0 = a(x+2)^2 - 8$ $8 = 4a$ $2 = a$ $\Rightarrow g(x) = 2(x+2)^2 - 8$	✓ substitution / _vervanging_ ✓ answer / antwoord (2)

4.3.2	$2(x+2)^2 - 8 = 0$
	 $(x+2)^2 = 4$
	 $x + 2 = \pm 2$
	 $\therefore \; x = 0$ or / _of_ $x = -4$
	 $OA = 4\,$units / _eenhede_
	
	 <center>**OR / OF**</center>
	 Using symmetry of parabola / _Gebruik van simmetrie van parabool_
	 O(0 ; 0) is 2 units away from axis of symmetry
	 O(0 ; 0) is 2 eenhede vanaf simmetrie-as
	
	 Therefore, coordinates of A(–4 ; 0)
	 Daarom is die koördinate van A(–4 ; 0)
	
	     ⇨ Length of OA = 4 units
	     ⇨ _Lengte van_ OA = 4 _eenhede_
		✓ equating to 0 / _stel gelyk aan_ 0
		
		 ✓ solving for x / _los op vir x_
		
		 ✓ answer / _antwoord_
		
		 <center>**OR / OF**</center>
		 ✓ use of symmetry /
		 gebruik van simmetrie
		
		 ✓ coordinates of A /
		 koördinate van A
		
		 ✓ answer / _antwoord_
		 (3)

4.3.3	Range of / _Terrein van_ f : $y \neq 1$; $y \in \Box$	✓ answer / _antwoord_ (1)
4.3.4	$y = -x$ $\therefore \; y = -(x+2) + 1$ $y = -x - 1$	✓ method / _metode_ ✓ answer / _antwoord_ (2)
4.4.1	$x \in (-4 ; 0)$	✓✓ answer / _antwoord_ (2)
4.4.2	$x \leq -4$ or / _of_ $x \geq -2$	✓✓ answer / _antwoord_ (2)
4.5	$-8 < k < 0$	✓ – 8 ✓ 0 ✓ answer / _antwoord_ (A) (3)
		[18]

QUESTION 5/*VRAAG 5*

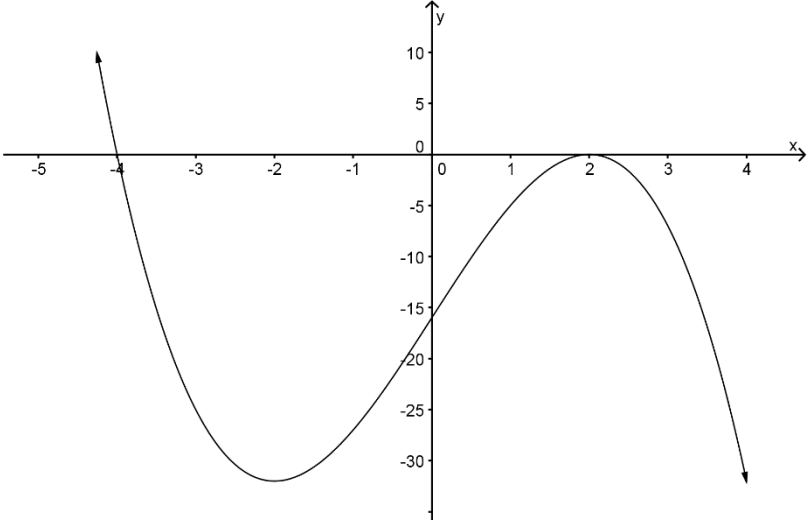|		
5.1	$C(0 ; 1)$	✓ answer / *antwoord* (1)
5.2	Range of / *Waardeversameling van* $f : y \in (0 ; \infty)$	✓ answer / *antwoord* (1)
5.3	$y = 3^x$ $x = 3^y$ $\therefore y = \log_3 x$	✓ interchanging x and y / *omruil van x en y* ✓ answer / *antwoord* (2)
5.4	$\log_3 x < -1$ $\Rightarrow x < 3^{-1}$ $\quad x < \dfrac{1}{3}$ but / *maar* $x > 0$ $\therefore \ 0 < x < \frac{1}{3}$	✓ $x < \dfrac{1}{3}$ ✓ answer / *antwoord* (2)
5.5	$g(x) = -x + 1$ $\quad$ $-x + 1 = 3$ $0 = -x + 1$ $\quad y = 3^x = 3^1 = 3$ $\quad -x = 2$ $x = 1$ $\quad\quad\quad\quad \Rightarrow Q(1;3)$ $\quad x = -2$ $\Rightarrow P(1;0)$ $\quad\quad\quad\quad\quad\quad \Rightarrow R(-2;3)$ $y = 3^{-2} = \dfrac{1}{9}$ $\Rightarrow S(-2;\frac{1}{9})$	✓ coordinates of P / *koördinate van P* ✓ coordinates of Q / *koördinate van Q* ✓ coordinates of R / *koördinate van R* ✓ coordinates of S / *koördinate van S* (4)
5.6	$f(x) = 3^x$ $\quad\quad$ $p(x) = 3(3)^x - 2 = 3^{x+1} - 2$ $\Rightarrow$ Horizontal shift of 1 unit to the left $\quad$ Vertical shift of 2 units down *Horisontale skuif van* 1 *eenheid na links* *Vertikale skuif van* 2 *eenhede af*	✓ horizontal shift / *horisontale skuif* ✓ vertical shift / *vertikale skuif* (2)
		[12]

QUESTION 6/*VRAAG 6*

6.1	$A = P(1-i)^n$ $20\,000 = 80\,000(1-i)^5$ $(1-i)^5 = 0,25$ $1-i = 0,7578582833$ $\quad i = 0,242141...$ $\therefore$ Annual rate of depreciation, r $\quad$ *Jaarlikse verminderingskoers,* r $= 24,21\%$	✓ substitution / *vervanging* ✓ simplification / *vereenvoudiging* ✓ answer / *antwoord* (3)
6.2	$1+i_{eff} = \left(1+\dfrac{i_{nom}}{m}\right)^m$ $\qquad = \left(1+\dfrac{8,5\%}{4}\right)^4$ $i_{eff} = \left(1+\dfrac{8,5\%}{4}\right)^4 - 1$ $\qquad = 0,0877...$ effective rate / *effektiewe koers* $= 8,77\%$ *p.a.*	✓ substitution / *vervanging* ✓ simplification / *vereenvoudiging* ✓ answer / *antwoord* (3)
6.3.1	$A = P(1+i)^n$ $\quad = x\left(1+\dfrac{11\%}{12}\right)^{36}$ $\quad = 1,39x$	✓ substitution / *vervanging* ✓ answer / *antwoord* (2)

6.3.2		
	$$\left[\left(x\left(1+\frac{11\%}{12}\right)^{36}+15\,000\right)\left(1+\frac{11\%}{12}\right)^{24}-7\,000\right]\left(1+\frac{12\%}{2}\right)^{6}=90132,56$$	✓ $\left(x\left(1+\frac{11\%}{12}\right)^{36}+15\,000\right)$
		✓ $\left(1+\frac{11\%}{12}\right)^{24}-7\,000$
		✓ $\times\left(1+\frac{12\%}{2}\right)^{6}$ and equating to R90 132,56 / *en gelyk stel aan R90 132,56*
	$$x=\left[\left(\frac{90132,56}{\left(1+\frac{12\%}{2}\right)^{6}}+7\,000\right)\div\left(1+\frac{11\%}{12}\right)^{24}-15\,000\right]\div\left(1+\frac{11\%}{12}\right)^{36}$$	✓ simplification / *vereenvoudiging*
	$=R30\,000,00$	✓ answer / *antwoord*
		(5)
	OR / *OF*	**OR / *OF***
	$$x\left(1+\frac{11\%}{12}\right)^{36}+15\,000=1,388878629x+15\,000$$	✓ $x\left(1+\frac{11\%}{12}\right)^{36}+15\,000$
	$$\left(1,388878629x+15\,000\right)\left(1+\frac{11\%}{12}\right)^{24}=1,72891573x+18\,672,43$$	✓ $\left(1,388878629x+15\,000\right)\left(1+\frac{11\%}{12}\right)^{24}$ and subtracting R7 000 *en aftrekking van R7 000*
	$$\left(1,72891573x+18\,672,43-7\,000\right)\left(1+\frac{12\%}{2}\right)^{6}=90132,56$$	✓ $\times\left(1+\frac{12\%}{2}\right)^{6}$ and/*en* equating to R90 132,56 / *en gelyk stel aan R90 132,56*
	$$2,4525x+16\,557,56=90132,56$$ $$2,4525x=73\,575,00$$ $$x=R30\,000,00$$	✓ simplification / *vereenvoudiging*
		✓ answer / *antwoord*
		(5)
		[13]

QUESTION 7/*VRAAG 7*

7.1	$f'(x) = \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$ $\boxed{\begin{array}{l} \text{Penalise 1 mark for incorrect notation in this question} \\ \textit{Penaliseer 1 punt vir verkeerde notasie in hierdie} \end{array}}$ $= \lim\limits_{h \to 0} \dfrac{\frac{1}{2}(x+h)^2 - \frac{1}{2}x^2}{h}$ $= \lim\limits_{h \to 0} \dfrac{\frac{1}{2}x^2 + xh + \frac{1}{2}h^2 - \frac{1}{2}x^2}{h}$ $= \lim\limits_{h \to 0} \dfrac{xh + \frac{1}{2}h^2}{h}$ $= \lim\limits_{h \to 0} \dfrac{h(x + \frac{1}{2}h)}{h}$ $\boxed{\begin{array}{l} \text{Answer ONLY: 0 marks} \\ \textit{SLEGS antwoord}: 0 \textit{ punte} \end{array}}$ $= \lim\limits_{h \to 0} \left(x + \frac{1}{2}h\right)$ $= x$	✓ $\frac{1}{2}x^2 + xh + \frac{1}{2}h^2$ ✓ simplification / *vereenvoudiging* ✓ factorisation / *faktorisering* (dividing by h / *deel deur h*) ✓ answer / *antwoord* (4)
7.2.1	$f(x) = \dfrac{1}{5}x^5 - 6x^{-2}$ $f'(x) = x^4 + 12x^{-3}$ $\quad\quad = x^4 + \dfrac{12}{x^3}$	✓ x^4 ✓ $12x^{-3}$ (2)
7.2.2	**(ENRICHMENT / *VERRYKING*)** $\dfrac{d}{dx}\left(x + \sqrt{x}\right)^2$ **OR / *OF*** Chain Rule / *Kettingreël* $= \dfrac{d}{dx}\left(x^2 + 2x\sqrt{x} + x\right)$ $= 2\left(x + \sqrt{x}\right)\left(1 + \frac{1}{2}x^{-\frac{1}{2}}\right)$ $= \dfrac{d}{dx}\left(x^2 + 2x^{\frac{3}{2}} + x\right)$ $= 2\left(x + \frac{1}{2}x^{\frac{1}{2}} + x^{\frac{1}{2}} + \frac{1}{2}\right)$ $= 2x + 3x^{\frac{1}{2}} + 1$ $= 2x + 3x^{\frac{1}{2}} + 1$ $= 2x + 3\sqrt{x} + 1$ $= 2x + 3\sqrt{x} + 1$	✓ $x^2 + 2x^{\frac{3}{2}} + x$ ✓✓✓ answer / *antwoord* (4)
		[10]

QUESTION 8/*VRAAG 8*

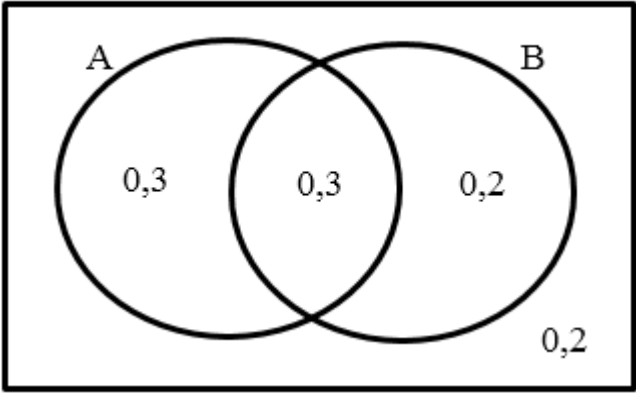|		
8.1.1	$f(x) = -x^3 + 12x - 16$ $f(2) = -(2)^3 + 12(2) - 16$ $\qquad = -8 + 24 - 16$ $\qquad = 0$ $\therefore \ (x-2)$ is a factor / *is 'n faktor*	✓ substitution / *vervanging* ✓ answer = 0 / *antwoord* = 0 (2)
8.1.2	$f(x) = -x^3 + 0x^2 + 12x - 16$ $\qquad = (x-2)(-x^2 - 2x + 8)$ $\qquad = (x-2)(x-2)(-x-4)$ Let / *Laat* $f(x) = 0$ $\therefore \ x = 2 \ ; \ x = 2 \ ; \ x = -4$	✓ $(-x^2 - 2x + 8)$ ✓ $(x-2)(-x-4)$ ✓ $x = 2 \ ; \ x = 2 \ ; \ x = -4$ (3)
8.1.3	$f'(x) = -3x^2 + 12 = 0$ $\qquad\quad -3x^2 = -12$ $\qquad\qquad x^2 = 4$ $\qquad\qquad x = \pm 2$ $\therefore \ (2;0) \ \& \ (-2;-32)$	✓ $f'(x) = 0$ ✓ simplification / *vereenvoudiging* ✓ x-values / *x-waardes* ✓ y-values / *y-waardes* (4)
8.1.4		✓ x-intercepts / *x-afsnitte* and/*en* y-intercept / *y-afsnit* ✓ turning points / *draaipunte* ✓ shape / *vorm* (3)

8.1.5	$f(x) = -x^3 + 12x - 16$
	
	 $f^{/}(x) = -3x^2 + 12$
	
	 $f^{//}(x) = -6x = 0$
	
	          $x = 0$; $y = -16$ **OR** / ***OF*** (otherwise / *andersins*)
	
	 Point of inflection / *infleksie - /buigpunt*: $(0 \; ; \; -16)$
	
	 $m = f^{/}(0) = -3(0)^2 + 12 = 12$
	
	 $y - (-16) = 12(x - 0)$
	 $y = 12x - 16$
		✓ *x*-coordinate / *x-koördinaat*
		
		 ✓ *y*-coordinate / *y-koördinaat*
		
		 ✓ gradient of tangent
		    gradiënt van raaklyn
		
		 ✓ equation of tangent
		    vergelyking van raaklyn
		                      (4)

8.2.1	$x \in \mathbb{R}$ (Accept / *Aanvaar* $x \neq 0$)	✓✓ answer / *antwoord* (2)
8.2.2	$x > 0$	✓✓ answer /*antwoord* (2)
		[20]

QUESTION 9/*VRAAG 9*

9.1	$PQ = \sqrt{x^2 + x^2}$ $\quad = \sqrt{2}x$ $QR = \sqrt{2(200-x)^2} = \sqrt{2}(200-x)$ Area / *Oppervlakte* $= l \times b$ $\quad = \sqrt{2}x \times \sqrt{2}(200-x)$ $\quad = 2(200x - x^2)$	✓ $PQ = \sqrt{2}x$ ✓ $QR = \sqrt{2}(200-x)$ ✓ substitution into area formula *vervanging in oppervlakte formule* (3)
9.2	$A(x) = 400x - 2x^2$ $A^{/}(x) = 400 - 4x = 0$ $\quad 400 = 4x$ $100 \text{ cm} = x$	✓ $A^{/}(x)$ ✓ $A^{/}(x) = 0$ ✓ answer / *antwoord* (3)
9.3	*Max area of PQRS* / *Maks.oppervlakte van PQRS* $= 400(100) - 2(100)^2$ $= 40\,000 - 20\,000$ $= 20\,000 \ cm^2$ *Area* / *Oppervlakte ABCD* $= 200 \times 200 = 40\,000\, cm^2$ Ratio / *Verhouding is* $1:2$ **OR / *OF*** $\dfrac{1}{2}$	✓ max. area of PQRS *Maks. oppervlakte van* PQRS ✓ area of ABCD / *oppervlakte van* ABCD ✓ answer / *antwoord* (3)
		[9]

QUESTION 10/*VRAAG 10*

10.1.1	NO / *NEE* $P(A \text{ and/}en \ B) = P(A) \times P(B)$ $\qquad\qquad\qquad = 0,6 \times 0,5$ $\qquad\qquad\qquad = 0,3$ $\therefore \ P(A \text{ and/}en \ B) \neq 0$	✓ No / *Nee* ✓ valid reason / *geldige rede* (2)
10.1.2		✓ (A and / *en* B) = 0,3 ✓ A(only / *alleen*) = 0,3 and/*en* B(only / *alleen*) = 0,2 ✓ not(A or B) = 0,2 *nie*(A *of* B) = 0,2 (3)
10.1.3 (a)	$P(\text{only/}slegs \ A) = 0,6 - 0,3$ $\qquad\qquad\qquad\quad = 0,3$	✓ answer / *antwoord* (1)
10.1.3 (b)	$P(\text{not } A \text{ or } \text{not } B) \quad / \quad P(nie \ A \ of \ nie \ B)$ $= P(\text{not } A) + P(\text{not } B) - P(\text{not } A \text{ and } \text{not } B)$ $\quad P(nie \ A) + P(nie \ B) - P(nie \ A \ en \ nie \ B)$ $= 0,4 + 0,5 - 0,2$ $= 0,7$ **OR */ OF*** $P(\text{not } A \text{ or } \text{not } B) = 1 - P(A \text{ and } B)$ $P(nie \ A \ of \ nie \ B) = 1 - P(A \ en \ B)$ $\qquad\qquad\qquad\quad = 1 - 0,3$ $\qquad\qquad\qquad\quad = 0,7$	✓ rule / *reël* ✓ answer / *antwoord* **OR */ OF*** ✓ rule / *reël* ✓ answer / *antwoord* (2)

10.2.1	$P(\text{Girl} / \textit{Meisie}) = \dfrac{62}{100}$	✓ answer / *antwoord* (1)

10.2.2	$P(\text{Boy} / \textit{Seun}) = \dfrac{38}{100}$ & $P(\textit{Like camping} / \textit{Hou van kamp}) = \dfrac{54}{100}$
	
	 $P(\textit{Boy} / \textit{Seun}) \times P(\textit{Like camping} / \textit{Hou van kamp})$
	
	 $= \dfrac{38}{100} \times \dfrac{54}{100}$
	 $= 0,2025$
	
	 $P(\textit{Boy and Like camping}) / P(\textit{Seun en Hou van kamp})$
	
	 $= \dfrac{24}{100}$
	 $= 0,24$
	
	 $\Rightarrow$ *Events are not independent / Gebeurtenisse is nie onafhanklik nie*
		✓ P(Boy) x P(like camping)
		    P(*Seun*) x P(*hou van kamp*)
		 ✓ answer / *antwoord*
		
		 ✓ P(Boy **and** Like camping)
		    P(*Seun **en** hou van kamp*)
		
		 ✓ conclusion / *gevolgtrekking*
		
		 (4)

10.3	Ratio / *Verhouding* : Green/*Groen* : Red/*Rooi*
	                        $3x : 4x$
	 Green+Red / *Groen + Rooi* $= 7x$
	
	 New Ratio / *Nuwe verhouding* : Green/*Groen* : Red/*Rooi*
	                      $3x + 3 : 4x + 2$
	 Green+Red / *Groen + Rooi* $= 7x + 5$
	
	 $\Rightarrow \dfrac{3x+3}{7x+5} = \dfrac{6}{13}$
	 $39x + 39 = 42x + 30$
	 $9 = 3x$
	 $3 = x$
	
	 Green / *Groen* $= 9$ balls / *balle*
	 Red / *Rooi* $= 12$ balls / *balle*
		✓ ratio in terms of x
		    verhouding i.t.v x
		
		 ✓ new ratio in terms of x
		    nuwe verhouding i.t.v x
		
		 ✓ $\dfrac{3x+3}{7x+5} = \dfrac{6}{13}$
		
		 ✓ value of x / *waarde van* x
		
		 ✓ answer / *antwoord*
		
		 (5)

		[18]
		TOTAL/*TOTAAL*: 150