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Basic Education
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SERTIFIKAAT

GRADE 12/*GRAAD* 12

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2018

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS: 150
PUNTE: 150

These marking guidelines consist of 18 pages.
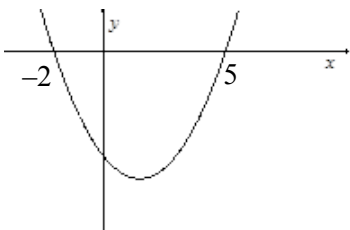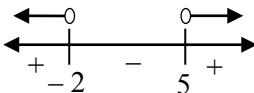*Hierdie nasienriglyne bestaan uit* **18** *bladsye*

NOTE:
- If a candidate answers a question TWICE, only mark the FIRST attempt.
- Consistent Accuracy applies in all aspects of the marking memorandum.

LET WEL:
- *Indien 'n kandidaat 'n vraag TWEE keer beantwoord, merk slegs die EERSTE poging.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*

QUESTION/*VRAAG* 1

1.1.1	$x^2 - 4x + 3 = 0$ $(x-3)(x-1) = 0$ $x = 3$ or $x = 1$	✓factors/correct subt in formula ✓$x = 3$ ✓$x = 1$ (3)
1.1.2	$5x^2 - 5x + 1 = 0$ $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \dfrac{5 \pm \sqrt{25 - 4(5)(1)}}{2(5)}$ $= \dfrac{5 \pm \sqrt{5}}{10}$ $x = 0{,}72$ or $x = 0{,}28$	✓substitution into the correct formula ✓$x = 0{,}72$ ✓$x = 0{,}28$ (3)
1.1.3	$x^2 - 3x - 10 > 0$ $(x-5)(x+2) > 0$ **OR/OF** $x < -2$ or $x > 5$	✓factors/ critical values ✓✓ $x < -2$ or $x > 5$ (3)
1.1.4	$3\sqrt{x} = x - 4$ $9x = x^2 - 8x + 16$ $x^2 - 17x + 16 = 0$ $(x-16)(x-1) = 0$ $x = 16$ or $x = 1$ NA	✓ squaring both sides ✓ $x^2 - 17x + 16 = 0$ ✓ factors ✓ answer with selection (4)

	OR/OF $$3x^{\frac{1}{2}} = x - 4$$ $$x - 3x^{\frac{1}{2}} - 4 = 0$$ $$\left(x^{\frac{1}{2}} - 4\right)\left(x^{\frac{1}{2}} + 1\right) = 0$$ $$x^{\frac{1}{2}} = 4 \quad \text{or} \quad x^{\frac{1}{2}} = -1$$ $$x = 16 \qquad\qquad \text{NA}$$	**OR/OF** ✓ standard form ✓ recognize $x = \left(x^{\frac{1}{2}}\right)^2$ ✓ factors ✓ answer with selection (4)
1.2	$$2y + 9x^2 = -1 ......(1)$$ $$3x - y = 2 \ ...... \ (2)$$ $$y = 3x - 2 \ ....(3)$$ $$2(3x - 2) + 9x^2 = -1$$ $$6x - 4 + 9x^2 = -1$$ $$9x^2 + 6x - 3 = 0$$ $$3x^2 + 2x - 1 = 0$$ $$(3x - 1)(x + 1) = 0$$ $$x = \frac{1}{3} \quad \text{or} \quad x = -1$$ $$y = -1 \ \text{or} \ y = -5$$	✓ $y = 3x - 2$ ✓substitution ✓ standard form ✓factors ✓both x values ✓both y values (6)
	OR/OF $$2y + 9x^2 = -1 ......(1)$$ $$3x - y = 2 \ ...... \ (2)$$ $$x = \frac{y + 2}{3}$$ $$2y + 9\left(\frac{y + 2}{3}\right)^2 = -1$$ $$2y + 9\left(\frac{y^2 + 4y + 4}{9}\right) = -1$$ $$2y + y^2 + 4y + 4 + 1 = 0$$ $$y^2 + 6y + 5 = 0$$ $$(y + 5)(y + 1) = 0$$ $$y = -1 \ \text{or} \ y = -5$$ $$x = \frac{1}{3} \quad \text{or} \quad x = -1$$	**OR/OF** ✓ $x = \dfrac{y + 2}{3}$ ✓substitution ✓ standard form ✓factors ✓both y values ✓both x values (6)

1.3	$3^{9x} = 64$		✓ $3^{3x} = 4$
	$\left(3^{3x}\right)^3 = (4)^3$		
	$3^{3x} = 4$		
	$5^{\sqrt{p}} = 64$		
	$\sqrt{5}^{\sqrt{p}} = \sqrt{64}$		✓ $\sqrt{5}^{\sqrt{p}} = 8$
	$\sqrt{5}^{\sqrt{p}} = 8$		
	$\dfrac{\left[3^{x-1}\right]^3}{\sqrt{5}^{\sqrt{p}}} = \dfrac{3^{3x-3}}{\sqrt{5}^{\sqrt{p}}}$ **OR/OF** $= \dfrac{3^{3x}.3^{-3}}{5^{\frac{\sqrt{p}}{2}}}$		✓ 3^{3x-3} or $3^{3x}.3^{-3}$
	$= \dfrac{3^{3x}}{27 \times \sqrt{5}^{\sqrt{p}}}$ $= \dfrac{\sqrt[3]{64}.3^{-3}}{\sqrt{64}}$		
	$= \dfrac{4}{27 \times 8}$		
	$= \dfrac{1}{54}$		✓ answer
			(4)
	OR/OF		**OR/OF**
	$\dfrac{\left(3^{x-1}\right)^3}{\sqrt{5}^{\sqrt{p}}} = \dfrac{3^{3x}.3^{-3}}{\left(5^{0.5}\right)^{\sqrt{p}}}$		
	$= \dfrac{3^{3x}.3^{-3}}{\left(5^{\sqrt{p}}\right)^{0.5}}$		✓ 3^{3x-3} or $3^{3x}.3^{-3}$
	$= \dfrac{4.3^{-3}}{\sqrt{64}}$		✓ $3^{3x} = 4$ ✓ $\sqrt{5}^{\sqrt{p}} = 8$
	$= \dfrac{4.\dfrac{1}{27}}{8} = \dfrac{1}{54}$		✓ answer
			(4)
			[23]

QUESTION/*VRAAG* 2

2.1.1	42	✓answer (1)
2.1.2	$2a = 6$ $\qquad$ $3a + b = 1$ $\qquad$ $a + b + c = 2$ $a = 3$ $\qquad$ $3(3) + b = 1$ $\qquad$ $(3) + (-8) + c = 2$ $\qquad\qquad\qquad$ $b = -8$ $\qquad\qquad\qquad$ $c = 7$ $T_n = 3n^2 - 8n + 7$ **OR/OF** $2a = 6$ $\ a = 3$ $T_n = 3n^2 + bn + c$ $T_1 : 3 + b + c = 2 \qquad b + c = -1 \ ......(1)$ $T_2 : 12 + 2b + c = 3 \qquad 2b + c = -9 \ ......(2)$ $T_2 - T_1 : b = -8$ Subst. in (1): $\ -8 + c = -1$ $\qquad\qquad\qquad c = 7$ $T_n = 3n^2 - 8n + 7$	✓ $a = 3$ ✓ $b = -8$ ✓ $c = 7$ ✓ $T_n = an^2 + bn + c$ (4) **OR/OF** ✓ $a = 3$ ✓ $b = -8$ ✓ $c = 7$ ✓ $T_n = an^2 + bn + c$ $\quad$ (4)
2.1.3	$T_{20} = 3(20)^2 - 8(20) + 7$ $\quad = 1047$	✓substitution ✓answer $\qquad$ (2)
2.2	$T_n = -7n + 42$ $-7n + 42 = -140$ $\quad -7n = -182$ $\qquad n = 26$	✓ $T_n = -7n + 42$ ✓ $-7n + 42 = -140$ ✓ $n = 26$ (3)
2.3	$S_n = \dfrac{n}{2}(a + l) \qquad$ **OR/OF** $\quad S_n = \dfrac{n}{2}[2a + (n-1)d]$ $S_n = \dfrac{n}{2}(35 - 7n + 42) \qquad\qquad S_n = \dfrac{n}{2}(70 - 7n + 7)$ $S_n = \dfrac{n}{2}(-7n + 77)$ $S_n = -\dfrac{7}{2}n^2 + \dfrac{77}{2}n$ $-\dfrac{7}{2}n^2 + \dfrac{77}{2}n = 3n^2 - 8n + 7$ $13n^2 - 93n + 14 = 0$ $(n - 7)(13n - 2) = 0$ $n = 7 \ \ or \ \ n = \dfrac{2}{13}$ $\qquad\qquad$ NA $\therefore n = 7$	✓ $S_n = \dfrac{n}{2}(35 - 7n + 42)$ or $\quad S_n = \dfrac{n}{2}(70 - 7n + 7)$ ✓simplification of S_n ✓equating ✓standard form ✓factors ✓answer with $\quad$ selection $\qquad$ (6)
		[16]

QUESTION/*VRAAG* 3

3.1	$r = \dfrac{1}{2}$ and $S_\infty = 6$ $S_\infty = \dfrac{a}{1-r}$ $6 = \dfrac{a}{1-\dfrac{1}{2}}$ $a = 3$	✓ substitution ✓ answer (2)
3.2	$T_n = ar^{n-1}$ $T_8 = 3\left(\dfrac{1}{2}\right)^7$ $T_8 = \dfrac{3}{128}$	✓✓ $T_8 = 3\left(\dfrac{1}{2}\right)^7$ (2)
3.3	$\displaystyle\sum_{k=1}^{n} 3(2)^{1-k} = 5{,}8125$ $3 + \dfrac{3}{2} + \dfrac{3}{4} + \ldots = 5{,}8125$ $S_n = \dfrac{a(1-r^n)}{1-r} = 5{,}8125$ $\dfrac{3\left[1-\left(\dfrac{1}{2}\right)^n\right]}{1-\dfrac{1}{2}} = 5{,}8125$ $6\left[1-\left(\dfrac{1}{2}\right)^n\right] = 5{,}8125$ $\left(\dfrac{1}{2}\right)^n = \dfrac{1}{32} = 0{,}03125$ $2^{-n} = 2^{-5}$ or $n\log\dfrac{1}{2} = \log\dfrac{1}{32}$ $n = 5$ $n = 5$	✓ $r = \dfrac{1}{2}$ ✓ substitution ✓ simplification ✓ answer (4)
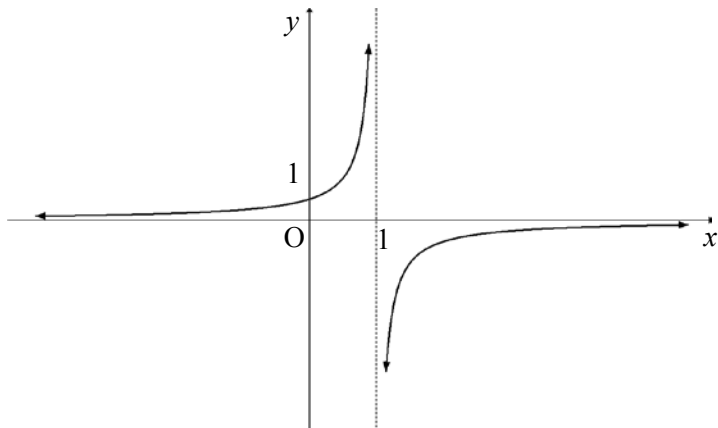
3.4	$\sum_{k=1}^{20} 3(2)^{1-k} = p$	
	$3 + \dfrac{3}{2} + \dfrac{3}{4} + ... + 3.2^{-19} = p$	✓expansion
	$\sum_{k=1}^{20} 24(2)^{-k}$	
	$= 12 + 6 + 3 + ... + 24.2^{-20}$	✓ expansion
	$= 4\left(3 + \dfrac{3}{2} + \dfrac{3}{4} + ... + 3.2^{-19}\right)$	
	$= 4p$	✓ answer (3)
	OR/OF	**OR/OF**
	$\sum_{k=1}^{20} 3(2)^{1-k} = p$	$\checkmark \sum_{k=1}^{20} 6(2)^{-k} = p$
	$\sum_{k=1}^{20} 6(2)^{-k} = p$	$\checkmark \sum_{k=1}^{20} 4 \times 6(2)^{-k}$
	$\therefore \sum_{k=1}^{20} 24(2)^{-k} = 4p$	✓$4p$ (3)
	OR/OF	**OR/OF**
	$\sum_{k=1}^{20} 24(2)^{-k} = \sum_{k=1}^{20} 4 \times 3 \times 2(2)^{-k}$	$\checkmark \sum_{k=1}^{20} 4 \times 3 \times 2(2)^{-k}$
	$= 4 \sum_{k=1}^{20} 3 \times 2(2)^{-k}$	$\checkmark 4 \sum_{k=1}^{20} 3 \times 2(2)^{-k}$
	$= 4 \sum_{k=1}^{20} 3 \times (2)^{1-k} = 4p$	✓$4p$ (3)
	OR/OF	**OR/OF**
	$S_{20} = \dfrac{3\left(\left(\frac{1}{2}\right)^{20} - 1\right)}{\frac{1}{2} - 1} = 6 = p$	✓ substitution and answer
	$S_{20} = \dfrac{12\left(\left(\frac{1}{2}\right)^{20} - 1\right)}{\frac{1}{2} - 1} = 24$	✓substitution and answer
	$24 = 4 \times 6 = 4p$	✓$4p$ (3)
		[11]

QUESTION/*VRAAG* 4

4.1	Yes For every x-value there is only one corresponding y value **OR/OF** One to one mapping (vertical line test)	✓answer ✓reason (2)
4.2	R(-12 ; -6)	✓answer (1)

4.3	$f(x) = ax^2$ substitute $(-6 ; -12)$
	
	   $-12 = a(-6)^2$
	
	   $a = \dfrac{-1}{3}$
		✓substitution
		
		✓answer
		
		(2)

4.4	$f : y = -\left(\dfrac{1}{3}\right)x^2$
	
	$f^{-1} : x = -\left(\dfrac{1}{3}\right)y^2$
	
	   $y^2 = -3x$
	
	   $y = \pm\sqrt{-3x}$
	Only $y = -\sqrt{-3x}$ and $x \le 0$
		
		✓swapping x and y
		
		✓ $y^2 = -3x$
		
		✓ $y = -\sqrt{-3x}$
		
		(3)

		[8]

QUESTION/*VRAAG* 5

5.1	Domain: $x \in R$; $x \ne 1$ **OR/OF** $x \in (-\infty ; 1) \cup (1 ; \infty)$	✓answer (1)
5.2	$x = 1$ $y = 0$	✓$x = 1$ ✓$y = 0$ (2)
5.3		✓ y intercept ✓vertical asymptote ✓shape (3)
5.4	$x \ge 0$; $x \ne 1$ **OR/OF** $0 \le x < 1$ or $x > 1$ **OR/OF** $x \in [0 ; 1) \cup (1 ; \infty)$	✓$x \ge 0$ ✓$x \ne 1$ (2) **OR/OF** ✓ $0 \le x < 1$ ✓ $x > 1$
		[8]

QUESTION/*VRAAG* 6

6.1	$y = mx + c$ $m = \dfrac{5-1}{4-0}$ $m = 1$ $c = 1$ $g(x) = x + 1$ **OR/OF** $y = mx + c$ $5 = m(4) + 1$ $m = 1$ $g(x) = x + 1$	✓substitution into gradient formula ✓y-intercept $(0 ; 1)$ (2) **OR/OF** ✓substitute $(4 ; 5)$ ✓$c = 1$ (2)
6.2	$x^2 - 2x - 3 = 0$ $(x+1)(x-3) = 0$ $x = -1$ or $x = 3$ A$(-1 ; 0)$ B$(3 ; 0)$	✓$y = 0$ ✓factors ✓x-values (3)
6.3	$x = \dfrac{-1+3}{2}$ or $x = \dfrac{-b}{2a} = \dfrac{-(-2)}{2(1)}$ or $f'(x) = 2x - 2 = 0$ $x = 1$ $f(x) = x^2 - 2x - 3$ $y = (1)^2 - 2(1) - 3$ or $y = (x^2 - 2x + (-1)^2) - 3 - 1$ $y = -4$ $= (x-1)^2 - 4$ $y \geq -4$ or $[-4 ; \infty)$	✓x-value ✓ substitution/ completing the square ✓ answer (3)

6.4.1	**MN:** $y = (x^2 - 2x - 3) - (x + 1)$
	          $= x^2 - 3x - 4$
	         $6 = x^2 - 3x - 4$
	         $0 = x^2 - 3x - 10$
	         $0 = (x - 5)(x + 2)$
	         $x = 5$ or $x = -2$
	
	         OT = 2 or OT = 5
	                NA
		✓ $x^2 - 3x - 4$
		 ✓substituting $y = 6$
		
		 ✓values of x
		
		 ✓ OT = 2 (4)

6.4.2	$y = x + 1$ substitute $x = -2$
	    $= (-2) + 1$
	    $= -1$
	 N$(-2 ; -1)$
		✓substituting $x = -2$
		
		 ✓answer (2)

6.5	$f'(x) = 2x - 2$ $2x - 2 = 1$ $x = \dfrac{3}{2}$ $f\left(\dfrac{3}{2}\right) = \dfrac{-15}{4}$ $y + \dfrac{15}{4} = 1\left(x - \dfrac{3}{2}\right)$ $\quad$ or $\quad -\dfrac{15}{4} = \dfrac{1}{2} + c$ $y = x - \dfrac{21}{4}$ **OR/OF** $x^2 - 2x - 3 = x + p$ $x^2 - 2x - 3 - x - p = 0$ This equation will have equal roots, therefore: $b^2 - 4ac = 0$ $(-3)^2 - 4(1)(-3 - p) = 0$ $9 + 12 + 4p = 0$ $p = \dfrac{-21}{4}$ $y = x - \dfrac{21}{4}$	✓ $f'(x) = 2x - 2$ ✓ $2x - 2 = 1$ ✓ $x = \dfrac{3}{2}$ ✓ $f\left(\dfrac{3}{2}\right) = \dfrac{-15}{4}$ ✓answer $\qquad\qquad$ (5) **OR/OF** ✓equating ✓equal roots ✓ substitution ✓simplification ✓answer $\qquad$ (5)
6.6	$k < \dfrac{-21}{4}$	✓answer $\qquad\qquad$ (1)
		[20]

QUESTION/*VRAAG* 7

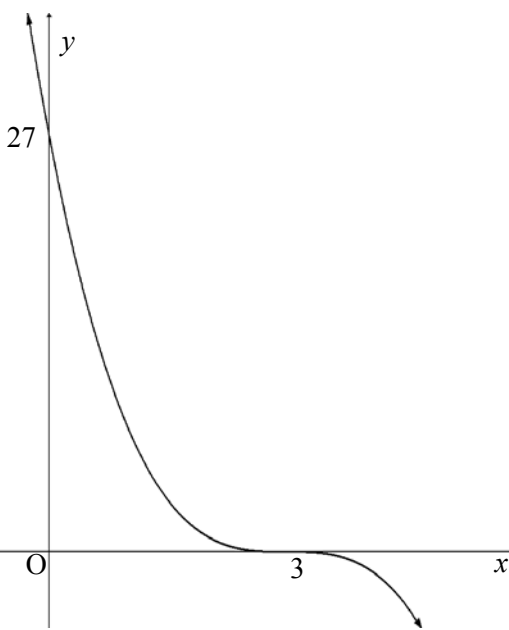| 7.1.1	$F = \dfrac{x[(1+i)^n - 1]}{i}$ $F = \dfrac{15\,000\left[\left(1+\dfrac{0,088}{4}\right)^{16} - 1\right]}{\dfrac{0,088}{4}}$ $F \quad = \text{R}283\,972,28$	✓ $\dfrac{0,088}{4}$ and $n = 16$ ✓ substitution into correct formula ✓ answer (3)
7.1.2	$A = \text{R}283\,972,28 - 100\,000\left(1+\dfrac{0,088}{4}\right)^4$ $\quad = \text{R }174\,877,60$ **OR/OF** Amount at end of 3 years: $F = \dfrac{15\,000\left[\left(1+\dfrac{0,088}{4}\right)^{12} - 1\right]}{\dfrac{0,088}{4}} - 100\,000$ $\quad = \text{R}103\,459,12$ Amount at end of 4 years: $P(1+i)^n + \dfrac{x[(1+i)^n - 1]}{i}$ $= 103\,459,12\left(1+\dfrac{0,088}{4}\right)^4 + \dfrac{15000\left[\left(1+\dfrac{0,088}{4}\right)^4 - 1\right]}{\dfrac{0,088}{4}}$ $= \text{R }174\,877,60$	✓ future value – amount including interest ✓ $100\,000\left(1+\dfrac{0,088}{4}\right)^4$ ✓ answer (3) **OR/OF** ✓ R15 000 including interest – R100 000 ✓ $\left(1+\dfrac{0,088}{4}\right)^4$ on P and x in F_v ✓ method (3)
7.2.1	$P = \dfrac{x\left[1-(1+i)^{-n}\right]}{i}$ $1\,500\,000 = \dfrac{x\left[1-\left(1+\dfrac{0,105}{12}\right)^{-12 \times 20}\right]}{\dfrac{0,105}{12}}$ $x = \text{R}14\,975,70$	✓ $i = \dfrac{0,105}{12}$ ✓ $n = 240$ ✓ substitution into correct formula ✓ answer (4)

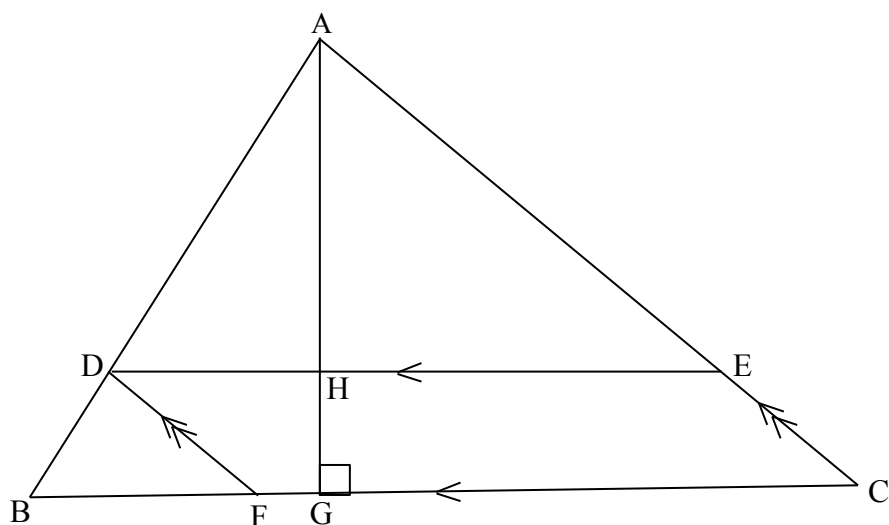| 7.2.2	$P = \dfrac{x\left[1-(1+i)^{-n}\right]}{i}$ $P = \dfrac{14\ 975,70\left[1-\left(1+\dfrac{0,105}{12}\right)^{-12\times8}\right]}{\dfrac{0,105}{12}}$ $P = \text{R}969\ 927,74$ **OR/OF** Balance outstanding = A – F $= 1\ 500\ 000\left(1+\dfrac{0,105}{12}\right)^{144} - \dfrac{14\ 975,70\left[\left(1+\dfrac{0,105}{12}\right)^{144}-1\right]}{\dfrac{0,105}{12}}$ $= \text{R}5\ 259\ 229,61 - \text{R}4\ 289\ 302,47$ $= \text{R}969\ 927,14$	✓R14 975,70 in P_v-formula ✓✓ $n = 96$ ✓ substitution into correct formula ✓ answer (5) **OR/OF** ✓ $n = 144$ in A-formula ✓ $n = 144$ in F_v-formula ✓ R14 975,70 ✓ A – F ✓ answer (5)
		[15]

QUESTION/*VRAAG* 8

8.1	$f'(x) = \lim\limits_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$ $= \lim\limits_{h\to 0} \dfrac{x^2+2xh+h^2-5-x^2+5}{h}$ $= \lim\limits_{h\to 0} \dfrac{h(2x+h)}{h}$ $= \lim\limits_{h\to 0} (2x+h)$ $= 2x$ **OR/OF** $f(x+h) = (x+h)^2 - 5$ $\quad\quad = x^2 + 2xh + h^2 - 5$ $f(x+h)-f(x) = x^2+2xh+h^2-5-(x^2-5)$ $\quad\quad\quad\quad\quad = 2xh+h^2$ $f'(x) = \lim\limits_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$ $= \lim\limits_{h\to 0} \dfrac{2xh+h^2}{h}$ $= \lim\limits_{h\to 0} \dfrac{h(2x+h)}{h}$ $= \lim\limits_{h\to 0}(2x+h)$ $= 2x$	✓ $x^2+2xh+h^2-5$ ✓simplification ✓factorisation ✓ $\lim\limits_{h\to 0}(2x+h)$ ✓ $2x$ (5) **OR/OF** ✓ $x^2+2xh+h^2-5$ ✓simplification ✓factorisation ✓ $\lim\limits_{h\to 0}(2x+h)$ ✓ $2x$ (5)
8.2.1	$y = 3x^3 + 6x^2 + x - 4$ $\dfrac{dy}{dx} = 9x^2 + 12x + 1$	✓ $9x^2$ ✓ $12x$ ✓ 1 (3)
8.2.2	$y(x-1) = 2x(x-1)$ $y = \dfrac{2x(x-1)}{x-1}$ if $x \neq 1$ $y = 2x$ $\dfrac{dy}{dx} = 2$	✓ $y(x-1)$ ✓ $2x(x-1)$ ✓ $y = 2x$ ✓answer (4)
		[12]

QUESTION/*VRAAG* 9

9.1.1	$g(x) = (x+5)(x-x_1)^2$	$\checkmark (x+5)$
	$20 = 5(x_1)^2$	
	$x_1^{\,2} = 4$	
	$x_1 = 2$	$\checkmark$ repeated root
	$g(x) = (x+5)(x-2)^2$	$\checkmark x_1 = 2$
	$g(x) = (x+5)(x^2 - 4x + 4)$	$\checkmark g(x) = (x+5)(x^2 - 4x + 4)$
	$g(x) = x^3 + x^2 - 16x + 20$	(4)
9.1.2	$g(x) = x^3 + x^2 - 16x + 20$	$\checkmark$ derivative
	$g'(x) = 3x^2 + 2x - 16$	
	$3x^2 + 2x - 16 = 0$	$\checkmark$ equating to zero
	$(3x+8)(x-2) = 0$	$\checkmark$ factors
	$x = \dfrac{-8}{3}$ or $x = 2$	
	$R\left(\dfrac{-8}{3}; \dfrac{1372}{27}\right)$ or $R(-2,67; 50,81)$	$\checkmark$ co-ordinates of R
	$P(2; 0)$	$\checkmark$ co-ordinates of P
		(5)
9.1.3	$g''(x) = 6x + 2$	$\checkmark g''(x) = 6x + 2$
	$g''(0) = 2$	$\checkmark g''(0) = 2$
	$\therefore$ concave up	$\checkmark$ conclusion (3)
	OR/OF	**OR/OF**
	$g''(x) = 6x + 2$	$\checkmark g''(x) = 6x + 2$
	$6x + 2 = 0$	
	$x = -\dfrac{1}{3}$ is the point of inflection	$\checkmark x = -\dfrac{1}{3}$
	$\therefore$ concave up	$\checkmark$ conclusion (3)

9.2		✓ y – intercept of a cubic graph ✓ point of inflection and stationary point, $x = 3$ ✓ concave up for $x < 3$ and concave down for $x > 3$
		(3)
		[15]

QUESTION/*VRAAG* 10

10.1	$\dfrac{AH}{HG} = \dfrac{3}{2}$	✓ answer (1)
10.2	Area of a parallelogram $= \text{base} \times \perp \text{height}$ $\text{Area} = \dfrac{3}{5}(5-t) \cdot \dfrac{2}{5}t$ $\text{Area} = \dfrac{6}{25}(5-t)t$ $A(t) = -\dfrac{6}{25}t^2 + \dfrac{6}{5}t$ $A'(t) = -\dfrac{12}{25}t + \dfrac{6}{5}$ $-\dfrac{12}{25}t + \dfrac{6}{5} = 0$ $12t - 30 = 0$ $t = \dfrac{30}{12} \text{ or } \dfrac{5}{2}$	✓ $\dfrac{2}{5}t$ ✓ $\dfrac{3}{5}(5-t)$ ✓ $A(t) = -\dfrac{6}{25}t^2 + \dfrac{6}{5}t$ ✓ $-\dfrac{12}{25}t + \dfrac{6}{5}$ ✓ answer (5)
		[6]

QUESTION/*VRAAG* 11

11.1.1	$7^5 = 16\ 807$	$\checkmark\checkmark$ answer	(2)
11.1.2	$7 \times 6 \times 5 \times 4 \times 3$ $= \dfrac{7!}{2!} = 2520$	$\checkmark\ 7 \times 6 \times 5 \times 4 \times 3$ or $\dfrac{7!}{2!}$ $\checkmark$ answer	(2)
11.2	$2 \times 7 \times 1 = 14$	$\checkmark\checkmark\checkmark\ 2 \times 7 \times 1$	(3)
			[7]

QUESTION/*VRAAG* 12

12.1	$P(A \text{ or } B) = P(A) + P(B)$ $0{,}74 = 0{,}45 + y$ $\phantom{0{,}74 = }y = 0{,}29$	$\checkmark\ P(A \text{ or } B) = P(A) + P(B)$ $\checkmark$ substitution $\checkmark$ answer (3)
12.2	 Let the number of mystery gift bags = x The total number of bags = $4x$ $\left(\dfrac{x}{4x}\right) \times \left(\dfrac{x-1}{4x-1}\right) = \dfrac{7}{118}$ $\dfrac{1}{4} \times \dfrac{x-1}{4x-1} = \dfrac{7}{118}$ $\dfrac{x-1}{4x-1} = \dfrac{28}{118}$ $118x - 118 = 112x - 28$ $x = 15$	$\checkmark\ 4x$ $\checkmark\left(\dfrac{x}{4x}\right)$ or $\left(\dfrac{1}{4}\right)$ $\checkmark\left(\dfrac{x-1}{4x-1}\right)$ $\checkmark\dfrac{1}{4} \times \dfrac{x-1}{4x-1}$ $\checkmark$ equating to $\dfrac{7}{118}$ $\checkmark$ answer (6)

	OR/OF P(gift and gift) = P(gift at first draw) × P(gift at second draw) $\dfrac{7}{118} = \dfrac{1}{4} \times$ P(gift at second draw) P(gift at second draw) $= \dfrac{7}{118} \div \dfrac{1}{4}$ $= \dfrac{14}{59}$ Therefore: P(gift at first draw) $= \dfrac{15}{60}$ And: 15 bags had mystery gifts inside	**OR/OF** $\checkmark \dfrac{1}{4}$ $\checkmark \dfrac{1}{4} \times$ P(gift at 2nd draw) $\checkmark \dfrac{7}{118} = \dfrac{1}{4} \times$ P(gift at 2nd draw) $\checkmark \dfrac{14}{59}$ $\checkmark \dfrac{15}{60}$ $\checkmark$ answer (6)
		[9]

TOTAL/*TOTAAL*: 150