basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

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

GRADE 12/*GRAAD 12*

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2020

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

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

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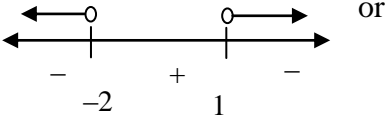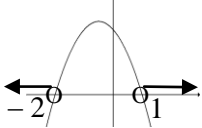- Consistent accuracy applies in all aspects of the marking memorandum.

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

REMEMBER: (A) next o the description of a tick implies accuracy mark
ONTHOU: (A) langs die beskrywing van `n regmerk impliseer akkuraatheids-punt
QUESTION/*VRAAG* 1

1.1.1	$x^2 - 6x = 0$ $x(x-6) = 0$ $x = 0$ or $x = 6$	✓ common factor ✓ both answers (2)
1.1.2	$x^2 + 10x + 8 = 0$ $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \dfrac{-10 \pm \sqrt{10^2 - 4(1)(8)}}{2(1)}$ $= \dfrac{-10 \pm \sqrt{68}}{2}$ $x = -0{,}88$ or $x = -9{,}12$	✓ substitution into the correct formula ✓ $-0{,}88$ ✓ $-9{,}12$ (3)
1.1.3	$(1-x)(x+2) < 0$ Critical values: $x = 1$ or $x = -2$ or $x < -2$ or $x > 1$	✓ critical values ✓ correct method ✓ answer (3)
1.1.4	$\sqrt{x+18} = x - 2$ $x + 18 = x^2 - 4x + 4$ $0 = x^2 - 5x - 14$ $(x-7)(x+2) = 0$ $x = 7$ or $x \neq -2$	✓ squaring both sides (m) ✓ standard form ✓ factors ✓ both answers ✓ rejection of $x = -2$ (5)

1.2	$x + y = 3$ $\quad y = 3 - x \ldots\ldots (1)$ $2x^2 + 4xy - y = 15 \ldots\ldots\ldots (2)$ Substitute (1) into (2): $\quad 2x^2 + 4x(3 - x) - (3 - x) = 15$ $2x^2 + 12x - 4x^2 - 3 + x - 15 = 0$ $\quad -2x^2 + 13x - 18 = 0$ $\quad 2x^2 - 13x + 18 = 0$ $\quad (2x - 9)(x - 2) = 0$ $\quad x = \dfrac{9}{2} \quad \text{or} \quad x = 2$ $\quad y = -\dfrac{3}{2} \quad \text{or} \quad y = 1$ **OR** $\quad x + y = 3$ $\quad x = 3 - y \ldots\ldots (1)$ $2x^2 + 4xy - y = 15 \ldots\ldots\ldots (2)$ Substitute (1) into (2): $\quad 2(3 - y)^2 + 4(3 - y)y - y = 15$ $2y^2 - 12y + 18 - 4y^2 + 12y - y - 15 = 0$ $\quad -2y^2 - y + 3 = 0$ $\quad 2y^2 + y - 3 = 0$ $\quad (2y + 3)(y - 1) = 0$ $\quad y = -\dfrac{3}{2} \quad \text{or} \quad y = 1$ $\quad x = \dfrac{9}{2} \quad \text{or} \quad x = 2$	✓ y subject of the formula ✓ substitution ✓ standard form ✓ factors ✓ x-values ✓ y-values (6) **OR** ✓ x subject of the formula ✓ substitution ✓ standard form ✓ factors ✓ y-values ✓ x-values (6)
1.3	$n^{200} < 5^{300}$ $(n^2)^{100} < (5^3)^{100}$ $(n^2)^{100} < (125)^{100}$ $n^2 < 125$ Maximum value of n is 11. **OR** $200 \log n < 300 \log 5$ $n < 10^{\frac{3}{2}\log 5}$ $n < 11{,}18$ $\therefore n = 11$ **OR**	✓ $(n^2)^{100} < (5^3)^{100}$ ✓ $n^2 < 125$ ✓ 11 (3) **OR** ✓ use of logs ✓ $n < 11{,}18$ ✓ 11 (3) **OR**

$n^{200} < 5^{300}$ $(n^2)^{100} < (5^3)^{100}$ $\sqrt{n^2} < \sqrt{5^3}$ $n < 5^{\frac{3}{2}}$ $n < 11{,}18$ $\therefore n = 11$ **OR** $n^{200} < 5^{300}$ $n < 5^{\frac{300}{200}}$ $n < 11{,}18$ $\therefore n = 11$	✓ $(n^2)^{100} < (5^3)^{100}$ ✓ $n < 11{,}18$ ✓ 11 (3) **OR** ✓ $n < 5^{\frac{300}{200}}$ ✓ $n < 11{,}18$ ✓ $n = 11$ (3)
	[22]

QUESTION/*VRAAG* 2
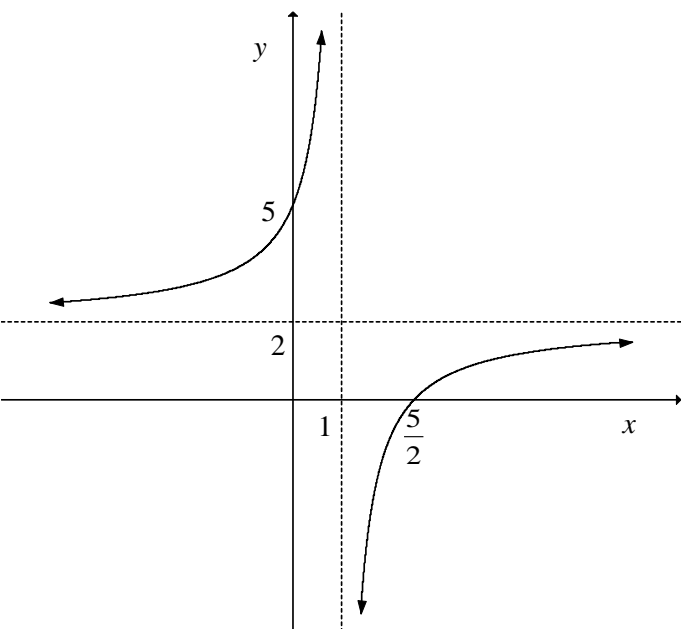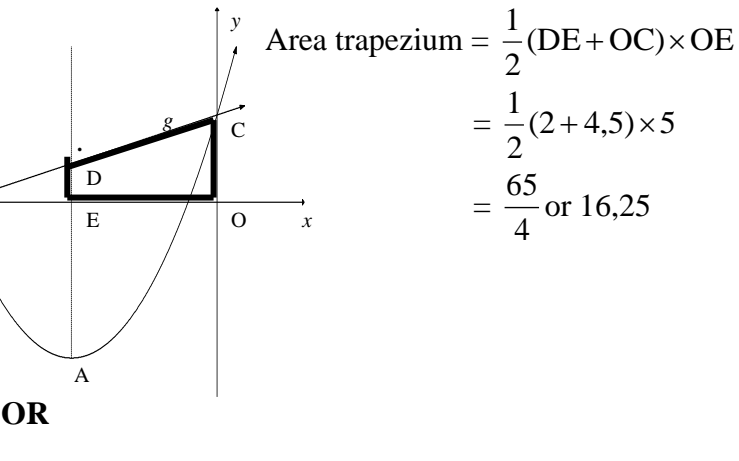
2.1	$7 \; ; \; x \; ; \; y \; ; \; -11 \; ; \; \ldots$ $$a = 7$$ $$a + 3d = -11$$ $$7 + 3d = -11$$ $$d = -6$$ $$x = a + d = 7 + (-6) = 1$$ $$y = a + 2d = 7 + 2(-6) = -5$$	✓ $7 + 3d = -11$ ✓ $d = -6$ ✓ value of x ✓ value of y (4)
	OR $$a + 3d = -11$$ $$3d = -11 - 7$$ $$3d = -18$$ $$d = -6$$ $$x = 1$$ $$y = -5$$	**OR** ✓ $3d = -11 - 7$ ✓ $d = -6$ ✓ $x = 1$ ✓ $y = -5$ (4)
	OR $$x - 7 = y - x \quad \text{and} \quad y - x = -11 - y$$ $$2x - 7 = y \;\;\ldots(1) \qquad 2y = -11 + x \ldots(2)$$ $$(1) \text{ into } (2)$$ $$2(2x - 7) = -11 + x$$ $$4x - 14 = -11 + x$$ $$3x = 3$$ $$x = 1$$ $$y = 2(1) - 7 = -5$$	**OR** ✓ 2 equations ✓ substitution ✓ value of x ✓ value of y (4)
2.2.1	$-3 \; ; \; 6 \; ; \; 27 \; ; \; 60 \; ; \; \ldots$ $$2a = 12$$ $$a = 6$$ $$3a + b = 9$$ $$3(6) + b = 9$$ $$b = -9$$ $$a + b + c = -3$$ $$6 - 9 + c = -3$$ $$c = 0$$ $$T_n = 6n^2 - 9n$$	✓ second difference ✓ $a = 6$ ✓ $b = -9$ ✓ $c = 0$ (4)

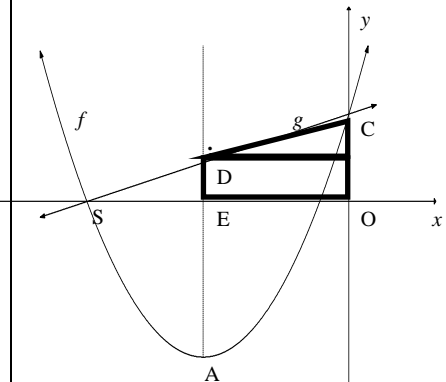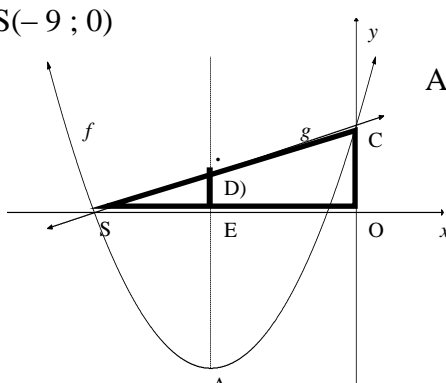| 2.2.2	$T_{50} = 6(50)^2 - 9(50)$ $\quad = 14\,550$	**Answer Only: Full Marks**	✓ substitute 50 ✓ answer (2)
2.2.3	$9 \,;\, 21 \,;\, 33 \,;\, \ldots$ $\quad a = 9$ $\quad d = 12$ $S_n = \dfrac{n}{2}\big[2a + (n-1)d\big]$ $S_n = \dfrac{n}{2}\big[2(9) + (n-1)(12)\big]$ $\quad = \dfrac{n}{2}\big[18 + 12n - 12\big]$ $\quad = \dfrac{n}{2}\big[12n + 6\big]$ $\quad = 6n^2 + 3n$		✓ a and d ✓ substitution into the correct formula ✓ $\dfrac{n}{2}\big[12n + 6\big]$ (3)

2.2.4	$-3 + S_n = 21060$
	$\qquad\quad S_n = 21063$
	$6n^2 + 3n = 21063$
	$6n^2 + 3n - 21063 = 0$
	$2n^2 + n - 7021 = 0$
	
	$n = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
	
	$n = \dfrac{-1 \pm \sqrt{(1)^2 - 4(1)(-7021)}}{2(2)}$
	
	$n = 59 \text{ or } n \neq \dfrac{-119}{2}$
	
	$\therefore \;\; n = 59$
	
	OR
	
	$T_n = 21060$
	$6n^2 - 9n - 21060 = 0$
	$2n^2 - 3n - 7020 = 0$
	$n = 60$
	
	$\therefore 59$ first differences must be added.
			✓ $-3 + S_n = 21060$
			
			✓ equation
			
			✓ standard form
			
			✓ answer
			     (4)
			
			✓ equation
			✓ standard form
			
			✓✓ answer
			     (4)

			[17]

QUESTION/*VRAAG* 3

3.1	$\sum_{k=1}^{\infty} 4.3^{2-k} = 12 + 4 + \frac{4}{3} + ...$ $r = \frac{4}{12} = \frac{1}{3}$ $-1 < \frac{1}{3} < 1$ $\therefore$ series is convergent $(-1 < r < 1)$	✓ $12 + 4 + \frac{4}{3} + ..$ or $36\left(\frac{1}{3}\right)^k$ ✓ value of r ✓ $-1 < r < 1$ (3)
3.2	$\sum_{k=p}^{\infty} 4.3^{2-k} = 4.3^{2-p} + 4.3^{1-p} + 4.3^{-p} + ...$ $a = 4.3^{2-p}$ $r = \frac{1}{3}$ $S_\infty = \frac{a}{1-r}$ $\frac{2}{9} = \frac{4.3^{2-p}}{1 - \frac{1}{3}}$ $4.3^{2-p} = \frac{4}{27}$ $3^{2-p} = 3^{-3}$ $2 - p = -3$ $p = 5$	✓ expression for a ✓ substitution of a, r and S_∞ ✓ simplification $\left(4.3^{2-p} = \frac{4}{27}\right)$ ✓ $3^{2-p} = 3^{-3}$ ✓ answer (5)
		[8]

QUESTION/*VRAAG* 4

4.1.1	$x = 1$ $y = 2$	✓ $x = 1$ ✓ $y = 2$ (2)
4.1.2	$y = mx + c$ $y - y_1 = m(x - x_1)$ $y = -(x - p) + q$ $2 = -1 + c$ **or** $y - 2 = -1(x - 1)$ **or** $= -(x - 1) + 2$ $c = 3$ $y - 2 = -x + 1$ $y = -x + 3$ $y = -x + 3$ $y = -x + 3$	✓ substitution of $m = -1$ and (1 ; 2) ✓ answer (2)

4.1.3		✓ vertical asymptote: $x = 1$
		        and
		 horizontal asymptote: $y = 2$
		 ✓ x-intercept: $\dfrac{5}{2}$
		 ✓ y-intercept: 5
		 ✓ shape (A)
		
		   (4)

4.2.1	$(-5 ; -8)$	✓ $x = -5$ ✓ $y = -8$ (2)
4.2.2	$y \geq -8$ **or** $[-8; \infty)$	✓ answer (1)

4.2.3	$m = -5$
	 $n = g(-5)$
	    $= \dfrac{1}{2}(-5) + \dfrac{9}{2}$
	    $= 2$
		✓ $m = -5$
		
		 ✓ substitution
		
		 ✓ $n = 2$
		   (3)

4.2.4		
	Area trapezium $= \dfrac{1}{2}(\text{DE} + \text{OC}) \times \text{OE}$ $= \dfrac{1}{2}(2 + 4{,}5) \times 5$ $= \dfrac{65}{4}$ or 16,25	✓ method ✓ correct substitution ✓ answer (3)
	OR	**OR**

$$\text{Area } \Delta = \frac{1}{2}b.h$$

$$= \frac{1}{2}(5)\left(\frac{5}{2}\right)$$

$$= \frac{25}{4}$$

$$\text{Area rect } = b.h$$
$$= (5)(2)$$
$$= 10$$

✓ method

✓ correct substitution
✓ answer (3)

Area trapezium = $\frac{25}{4}$ + 10 = $\frac{65}{4}$ or 16,25

OR

OR
S(− 9 ; 0)

$$\text{Area } \Delta \text{ SOC} = \frac{1}{2}b.h$$

$$= \frac{1}{2}(9)\left(\frac{9}{2}\right)$$

$$= \frac{81}{4}$$

Area Δ SED = $\frac{1}{2}b.h = \frac{1}{2}(4)(2) = 4$

Area trapezium = area Δ SOC − Area Δ SED

$$= \frac{81}{4} - 4$$

$$= \frac{65}{4} \text{ or } 16,25$$

✓ method

✓ correct substitution

✓ answer (3)

4.2.5	$g^{-1}: \ x = \frac{1}{2}y + \frac{9}{2}$ $g^{-1}: \ y = 2x - 9$	✓ changing x and y ✓ answer (2)

4.2.6	$f(x) = \frac{1}{2}(x+5)^2 - 8$	
	$f(x) = \frac{1}{2}(x^2 + 10x + 25) - 8$	
	$f(x) = \frac{1}{2}x^2 + 5x + 4,5$	
	$f'(x) = x + 5$	✓ $f'(x)$
	$h(x) = 2x - 9 + k$	
	$x + 5 = 2$	✓ $x + 5 = 2$
	$x = -3 \quad y = -6$	
	$(-3 ; -6)$	✓ $x = -3$ ✓ $y = -6$
		(4)
	OR	**OR**
	$f(x) = h(x)$	
	$\frac{1}{2}(x+5)^2 - 8 = 2x - 9 + k$	✓ equating
	$\frac{1}{2}x^2 + 3x + \frac{27}{2} - k = 0$	
	$x = \dfrac{-3}{2\left(\frac{1}{2}\right)} = -3 \qquad b^2 - 4ac = 0$	✓ turning point / $\triangle = 0$
	$y = -6$	
	$(-3 ; -6)$	✓ $x = -3$ ✓ $y = -6$ (4)
		[23]

QUESTION/*VRAAG* 5

5.1	A(0 ; 1)	✓ answer (1)
5.2	$9 = 3^{-x}$ $3^2 = 3^{-x}$ $x = -2$ B(−2 ; 9)	✓ equating ✓ $3^2 = 3^{-x}$ ✓ $x = -2$ (3)
5.3	$x \in (0;\infty)$ or $x > 0$	✓✓answer (2)
5.4	$h(x) = 27.3^{-x}$ $h(x) = 3^{-(x-3)}$ *f* shifted 3 units to the right	✓ $h(x) = 3^{-(x-3)}$ ✓3 units ✓ right (3)
5.5	$\dfrac{27}{3^x} < 1$ \qquad $3^{-x+3} < 1$ $3^x > 27$ **or** $3^{-x+3} < 3^0$ $3^x > 3^3$ \qquad $-x+3 < 0$ $x > 3$ \qquad\qquad $x > 3$ **OR** The graph shifts 3 units to the right Thus the *y*-intercept shift 3 units to the right (3 ; 1) $\therefore x > 3$	✓ $3^x > 27$ **or** $3^{-x+3} < 3^0$ ✓ $3^x > 3^3$ **or** $-x+3 < 0$ ✓ $x > 3$ (3) **OR** ✓ translation ✓ *y*-intercept ✓answer (3)
		[12]

QUESTION/*VRAAG* 6

6.1.1	$F = \dfrac{x\left[(1+i)^n - 1\right]}{i}$ $= \dfrac{1\,000\left[\left(1 + \dfrac{0,075}{12}\right)^{145} - 1\right]}{\dfrac{0,075}{12}}$ $= R234\,888,53$	✓ $n = 145$ ✓ $i = \dfrac{0,075}{12}$ ✓ substitution into the correct formula ✓ answer (4)
6.1.2	$A = P(1+i)^n$ $= 234\,888,53\left(1 + \dfrac{0,075}{12}\right)^{12}$ $= R253\,123,54$	✓ substitution into the correct formula ✓ answer (2)
6.2	$A = P(1-i)^n$ $92\,537,64 = 250\,000(1 - 0,22)^n$ $0,37015056 = (0,78)^n$ $n = \dfrac{\log 0,37015056}{\log 0,78}$ $n = 4$ years	✓ substitution into the correct formula ✓ correct use of logs ✓ answer (3)
6.3.1	Loan amount: $= \dfrac{x[1 - (1+i)^{-n}]}{i}$ $= \dfrac{1500\left[1 - \left(1 + \dfrac{0,113}{12}\right)^{-72}\right]}{\dfrac{0,113}{12}}$ $= R78\,173,49323$	✓ 72 ✓ substitution into the correct formula ✓ answer (3)
6.3.2	Balance after 5 years: $P = \dfrac{x\left[1 - (1+i)^{-n}\right]}{i}$ $= \dfrac{1\,500\left[1 - \left(1 + \dfrac{0,113}{12}\right)^{-12}\right]}{\dfrac{0,113}{12}}$ $= R16\,945,00629$ Amount paid: $R1\,500 \times 60 = R90\,000$ Interest $= $ Amount paid $-$ [Loan $-$ Balance] $= R90\,000 - [\,R78\,173,49323 - R16\,945,00629]$ $= R28\,771,51$	✓ substitution (A) ✓ R16 945,00629 (A) ✓ R90 000 $-$ [Loan $-$ Balance] ✓ answer (4)

	OR Balance $= 78\,173,49\left(1+\dfrac{0,133}{12}\right)^{60} - \dfrac{1\,500\left(\left(1+\dfrac{0,113}{12}\right)^{60}-1\right)}{\dfrac{0,113}{12}}$ Balance = R16 945.00 Amount paid: $R1\,500 \times 60 = R90\,000$ Interest = Amount paid – [Loan – Balance] $= R90\,000 - [\,R78\,173,49323 - R16\,945,00629\,]$ = R28 771,51	**OR** ✓ substitution ✓ R16 945,00629 ✓ R90 000 – [Loan – Balance] ✓ answer (4)
		[16]

QUESTION/*VRAAG* 7
Penalty of – 1 for notation only in 7.1

7.1	$f(x) = 2x^2 - 1$ $f(x+h) = 2(x+h)^2 - 1$ $= 2(x^2 + 2xh + h^2)^2 - 1$ $= 2x^2 + 4xh + 2h^2 - 1$ $f(x+h) - f(x) = 2x^2 + 4xh + 2h^2 - 1 - (2x^2 - 1)$ $= 2x^2 + 4xh + 2h^2 - 1 - 2x^2 + 1$ $= 4xh + 2h^2$ $f'(x) = \lim_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$ $= \lim_{h \to 0} \dfrac{4xh + 2h^2}{h}$ $= \lim_{h \to 0} \dfrac{h(4x + 2h)}{h}$ $= \lim_{h \to 0} (4x + 2h)$ $= 4x$	✓ $2x^2 + 4xh + 2h^2 - 1$ ✓ $4xh + 2h^2$ ✓ substitution ✓ simplification ✓ answer (5)
7.2.1	$\dfrac{d}{dx}\left(\sqrt[5]{x^2} + x^3 \right)$ $= \dfrac{d}{dx}\left(x^{\frac{2}{5}} + x^3 \right)$ $\dfrac{dy}{dx} = \dfrac{2}{5} x^{-\frac{3}{5}} + 3x^2$	✓ $x^{\frac{2}{5}}$ ✓ $\dfrac{2}{5} x^{-\frac{3}{5}}$ ✓ $3x^2$ (3)
7.2.2	$f(x) = \dfrac{4x^2 - 9}{4x + 6}$ $= \dfrac{(2x-3)(2x+3)}{2(2x+3)}$ $= \dfrac{2x-3}{2}$ $= x - \dfrac{3}{2}$ $f'(x) = 1$	✓ $(2x-3)(2x+3)$ ✓ $2(2x+3)$ ✓ simplification to two separate terms ✓ answer (4)
		[12]

QUESTION/*VRAAG* 8

8.1	$-1 < x < 2$	✓✓ answer (2)
8.2	$x = \dfrac{-1+2}{2}$ $x = \dfrac{1}{2}$ **Answer Only: Full Marks**	✓ method ✓ answer (2)
8.3	From the graph $x > \dfrac{1}{2}$ **Answer Only: Full Marks**	✓✓ answer (2)
8.4	$g(x) = ax^3 + bx^2 + cx$ $g'(x) = 3ax^2 + 2bx + c = -6x^2 + 6x + 12$ $3a = -6.$ $\quad 2b = 6 \quad\quad c = 12$ $a = -2 \quad\quad b = 3$ $g(x) = -2x^3 + 3x^2 + 12x$	✓ $g'(x) = 3ax^2 + 2bx + c$ ✓ $a = -2$ ✓ $b = 3$ ✓ $g(x) = -2x^3 + 3x^2 + 12x$ (4)
8.5	$g'\left(\dfrac{1}{2}\right) = -6\left(\dfrac{1}{2}\right)^2 + 6\left(\dfrac{1}{2}\right) + 12$ $m = \dfrac{27}{2} \quad$ or $13{,}5$ $y = -2\left(\dfrac{1}{2}\right)^3 + 3\left(\dfrac{1}{2}\right)^2 + 12\left(\dfrac{1}{2}\right)$ $y = \dfrac{13}{2} \quad$ or $\quad 6{,}5$ $y - y_1 = m(x - x_1)$ $y - 6{,}5 = 13{,}5(x - 0{,}5)$ $y = 13{,}5x - 0{,}25$	✓ max gradient at $x = \dfrac{1}{2}$ ✓ answer ✓ y value ✓ substitution ✓ answer (5)
		[15]

QUESTION/*VRAAG* 9

9.1	Total surface area $= 2\ell w + 2wh + 2\ell h$ but: $\ell = 3w$ Total surface area $= 6w^2 + 2wh + 6wh$ $\begin{aligned} C &= 15(6w^2) + 6(2wh + 6wh) \\ &= 15(6w^2) + 6(8wh) \\ &= 90w^2 + 48wh \end{aligned}$	✓ $2\ell w + 2wh + 2\ell h$ ✓ $\ell = 3w$ ✓ $15(6w^2)$ ✓ $6(2wh + 6wh)$ (4)
9.2	$5 = 3w^2 h$ $h = \dfrac{5}{3w^2}$ $C = 90w^2 + 48wh$ $C(w) = 90w^2 + 48w\left(\dfrac{5}{3w^2}\right)$ $\qquad = 90w^2 + 80w^{-1}$ $C^{\,/}(w) = 180w - 80w^{-2}$ $180w - 80w^{-2} = 0$ $180w^3 - 80 = 0$ $w^3 = \dfrac{80}{180}$ $w = \sqrt[3]{\dfrac{80}{180}}$ $w = 0{,}76$	✓ $h = \dfrac{5}{3w^2}$ ✓ substitution ✓ $C(w) = 90w^2 + 80w^{-1}$ ✓ derivative ✓ equating derivative to zero ✓ value of w (6)
		[10]

QUESTION/*VRAAG* 10

10.1	10^{10} or 10 000 000 000	✓✓ answer (2)
10.2.1	$\underline{8} \times \underline{10} \times \underline{10} \quad \times \quad \underline{8} \times \underline{8} \times \underline{10} \quad \times \quad \underline{2} \times \underline{10} \times \underline{10} \times \underline{10}$ Area $\qquad$ exchange $\qquad$ number No. of valid 10-digit numbers $= (8 \times 10 \times 10) \times (8 \times 8 \times 10) \times (2 \times 10 \times 10 \times 10)$ $= 1{,}024 \times 10^9$	✓ $\underline{8} \times \underline{10} \times \underline{10}$ or $\underline{8} \times \underline{8} \times \underline{10}$ ✓ $\underline{2} \times \underline{10} \times \underline{10} \times \underline{10}$ ✓ $1{,}024 \times 10^9$ (A) (3)
10.2.2	Probability $= \dfrac{1{,}024 \times 10^9}{10^{10}}$ $= \dfrac{64}{625} = 0{,}1024 = 10{,}24\%$	✓ $\dfrac{1{,}024 \times 10^9}{10^{10}}$ ✓ answer (2)
		[7]

QUESTION/*VRAAG* 11

11	First shot Second shot Third shot	
11.1	P (Bull's eye first shot and second shot) $= 0{,}5 \times 0{,}5$ $= 0{,}25$ or $\dfrac{1}{4}$	✓ two 0,5's ✓ $0{,}5 \times 0{,}5$ (2)

11.2	P (Bull's eye at least twice in 3 shots) $= (0,5 \times 0,5 \times 0,5) + (0,5 \times 0,5 \times 0,5) + (0,5 \times 0,5 \times 0,5) +$ $\quad (0,5 \times 0,5 \times 0,5)$ $= 0,125 + 0,125 + 0,125 + 0,125$ $= 0,5 \quad$ or $\quad \dfrac{1}{2}$	✓ $0,5 \times 0,5 \times 0,5$ ✓ four events ✓ answer (A) (3)
11.3	Person shoots first: $(0,5) + (0,5)^3 + (0,5)^5 + ...$ $P = \dfrac{a}{1-r}$ $P = \dfrac{0,5}{1-0,25}$ $P = \dfrac{2}{3} = 0,67$	✓ $(0,5) + (0,5)^3$ ✓ $... + (0,5)^5 + ...$ ✓ $P = \dfrac{0,5}{1-0,25}$ (3)
		[8]

TOTAL/*TOTAAL*: 150