



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS/
*SENIORSERTIFIKAAT-EKSAMEN/
NASIONALE SENIORSERTIFIKAAT-EKSAMEN***

MATHEMATICS P1/*WISKUNDE V1*

MAY/JUNE/*MEI/JUNIE* 2026

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

**These marking guidelines consist of 15 pages.
*Hierdie nasienriglyne bestaan uit 15 bladsye.***

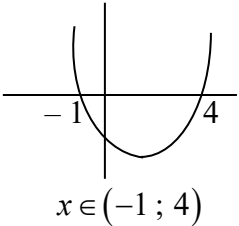
NOTE:

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

LET WEL:

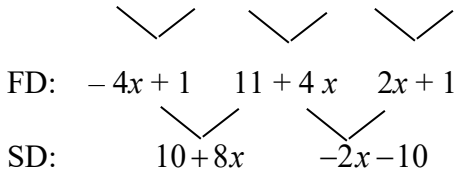
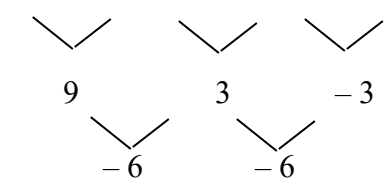
- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.
- Volgehoue akkuraatheid is DEURGAANS op ALLE aspekte van die nasienriglyne van toepassing.

QUESTION1/VRAAG 1

1.1.1	$x^2 - 9 = 0$ $(x-3)(x+3) = 0$ OR/OF $x^2 = 9$ $\therefore x = 3$ or $x = -3$ $\therefore x = 3$ or $x = -3$	✓ factors/root/formula ✓ both answers (2)
1.1.2	$2x^2 + 3x - 7 = 0$ $x = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(-7)}}{2(2)}$ $x = \frac{-3 \pm \sqrt{65}}{4}$ $\therefore x = 1,27$ or $x = -2,77$	✓ correct substitution into correct formula ✓ answer ✓ answer (3)
1.1.3	$-x^2 + 3x > -4$ $-x^2 + 3x + 4 > 0$ $x^2 - 3x - 4 < 0$ $(x-4)(x+1) < 0$ cv's: 4 ; -1 $-1 < x < 4$ OR/OF $x \in (-1 ; 4)$	 ✓ standard form ✓ critical values ✓✓ answer (4)
1.1.4	$\sqrt{7x+2} + 2x = 8$ $\sqrt{7x+2} = 8 - 2x$ $(\sqrt{7x+2})^2 = (8-2x)^2$ $7x+2 = 64 - 32x + 4x^2$ $4x^2 - 39x + 62 = 0$ $(4x-31)(x-2) = 0$ $\therefore x \neq \frac{31}{4}$ or $x = 2$	✓ isolating surd ✓ squaring both sides ✓ standard form ✓ answers with rejection (4)

1.2	$\frac{2^x \cdot 2^y}{4} = 1$ $2^x \cdot 2^y = 2^2$ $2^{x+y} = 2^2$ $\therefore x + y = 2$ $y = 2 - x \quad \dots(1)$ $-2x^2 + 3xy = y^2 \quad \dots(2)$ $-2x^2 + 3x(2 - x) = (2 - x)^2$ $-2x^2 + 6x - 3x^2 = 4 - 4x + x^2$ $-6x^2 + 10x - 4 = 0$ $3x^2 - 5x + 2 = 0$ $(3x - 2)(x - 1) = 0$ $x = \frac{2}{3} \quad \text{or} \quad x = 1$ $y = \frac{4}{3} \quad \text{or/of} \quad y = 1$ OR/OF $\frac{2^x \cdot 2^y}{4} = 1$ $2^x \cdot 2^y = 2^2$ $2^{x+y} = 2^2$ $\therefore x + y = 2$ $x = 2 - y \quad \dots(1)$ $-2x^2 + 3xy = y^2 \quad \dots(2)$ $-2(2 - y)^2 + 3(2 - y)y = y^2$ $-8 + 8y - 2y^2 + 6y - 3y^2 = y^2$ $-6y^2 + 14y - 8 = 0$ $3y^2 - 7y + 4 = 0$ $(3y - 4)(y - 1) = 0$ $y = \frac{4}{3} \quad \text{or/of} \quad y = 1$ $x = \frac{2}{3} \quad \text{or/of} \quad x = 1$	✓ exponential law ✓ isolating y ✓ substitution ✓ standard form ✓ both x-values ✓ both y-values (6) OR/OF ✓ exponential law ✓ isolating x ✓ substitution ✓ standard form ✓ both y-values ✓ both x-values (6)
1.3	$(\sqrt{6p} + \sqrt[4]{128})(\sqrt{6p} - \sqrt[4]{128}) = 54 + a\sqrt{2}$ $6p - \sqrt{128} = 54 + a\sqrt{2}$ $6p - 8\sqrt{2} = 54 + a\sqrt{2}$ $\therefore 6p = 54 \quad \text{and} \quad a = -8$ $p = 9 \quad \text{and} \quad a = -8$ $a - p = -8 - 9$ $\therefore a - p = -17$	✓ expansion ✓ equating parts ✓ values ✓ answer (4)
		[23]

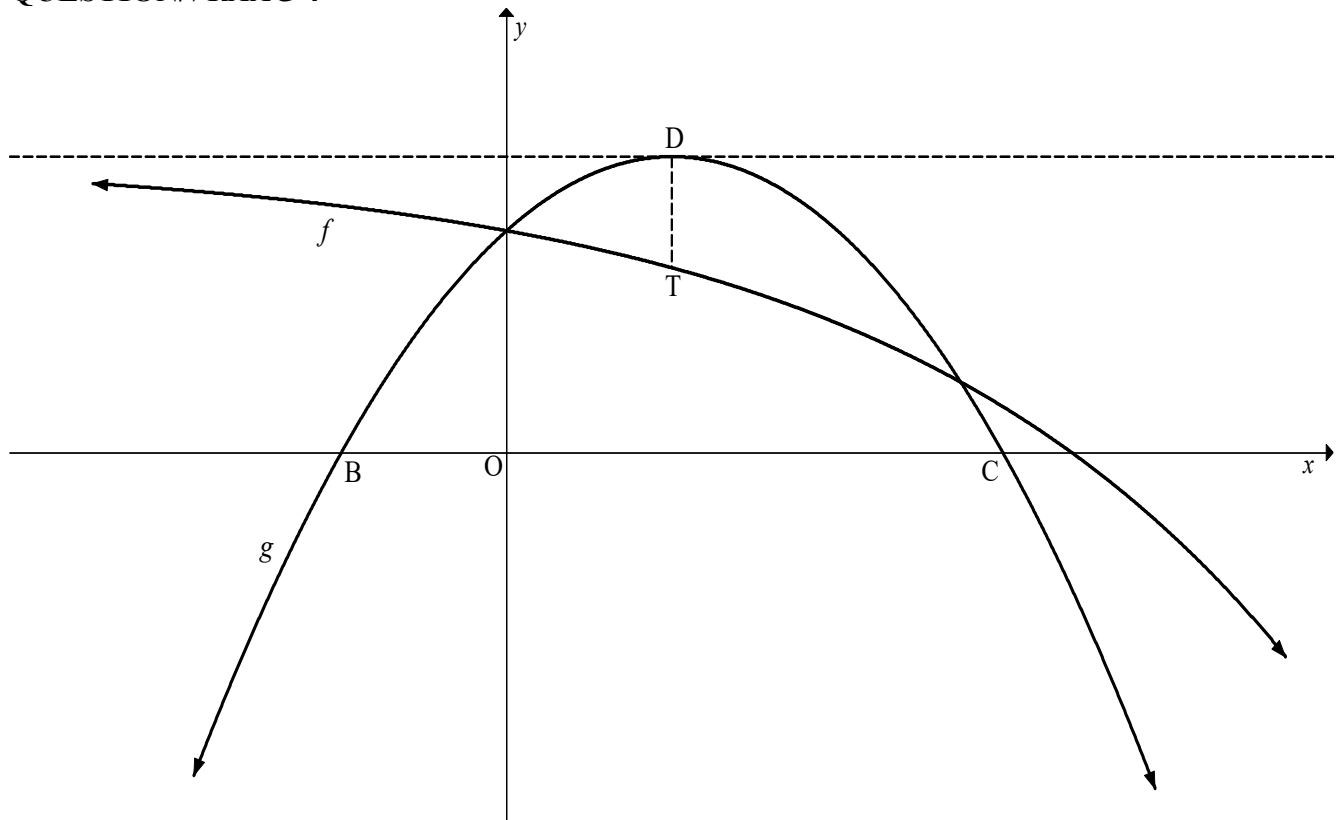
QUESTION/VRAAG 2

2.1.1	$6 + (n-1)(4) = 602$ $4n + 2 = 602$ $4n = 600$ $\therefore n = 150$	✓ equating ✓ answer (2)
2.1.2	$S_n = \frac{n}{2}[2(6) + (n-1)(4)]$ $S_n = \frac{n}{2}[12 + 4n - 4]$ $S_n = \frac{n}{2}[4n + 8]$ $S_n = 2n^2 + 4n$	✓ substitution ✓ simplification (2)
2.1.3	$S_{150} - S_{99}$ $= 2(150)^2 + 4(150) - 2(99)^2 - 4(99)$ $= 25\,602$ OR/OF $402 + 406 + \dots + 602$ $S_{51} = \frac{51}{2}[402 + 602]$ or $S_{51} = \frac{51}{2}[2(402) + (51-1)(4)]$ $S_{51} = 25\,602$	✓ substitution ✓ answer (2) OR/OF ✓ substitution ✓ answer (2)
2.2.1	QP: -1 ; $-4x$; 11 ; $2x + 12$; ...  FD: $-4x + 1$ $11 + 4x$ $2x + 1$ SD: $10 + 8x$ $-2x - 10$ $10 + 8x = -2x - 10$ $10x = -20$ $\therefore x = -2$	✓ first differences ✓ second differences ✓ equating ✓ answer (4)
2.2.2	-1 ; 8 ; 11 ; 8 ; ...  $2a = -6$ $3(-3) + b = 9$ $-3 + 18 + c = -1$ $a = -3$ $b = 18$ $c = -16$ $\therefore T_n = -3n^2 + 18n - 16$	✓ $2a = -6$ ✓ $3(-3) + b = 9$ ✓ $-3 + 18 + c = -1$ (3)

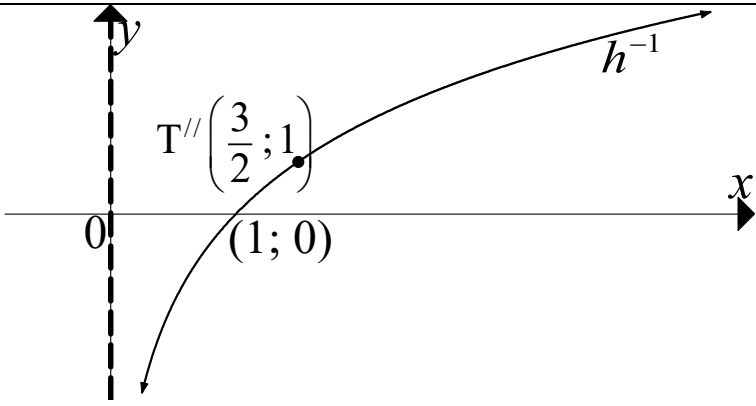
2.2.3	$S_n = \frac{n}{2} [2a + (n-1)d]$ $\frac{n}{2} [2(9) + (n-1)(-6)] < -1\,380$ $n[18 - 6n + 6] < -2\,760$ $-6n^2 + 24n < -2\,760$ $-6n^2 + 24n + 2\,760 < 0$ $6n^2 - 24n - 2\,760 > 0$ $n^2 - 4n - 460 > 0$ $n > 23,54 \quad \text{or} \quad n < -19,54$ n.a From $n = 24$, the sum of the first differences will be smaller than $-1\,380$	✓ substitution in S_n ✓ standard form ✓ answer with selection ✓ answer (4)
		[17]

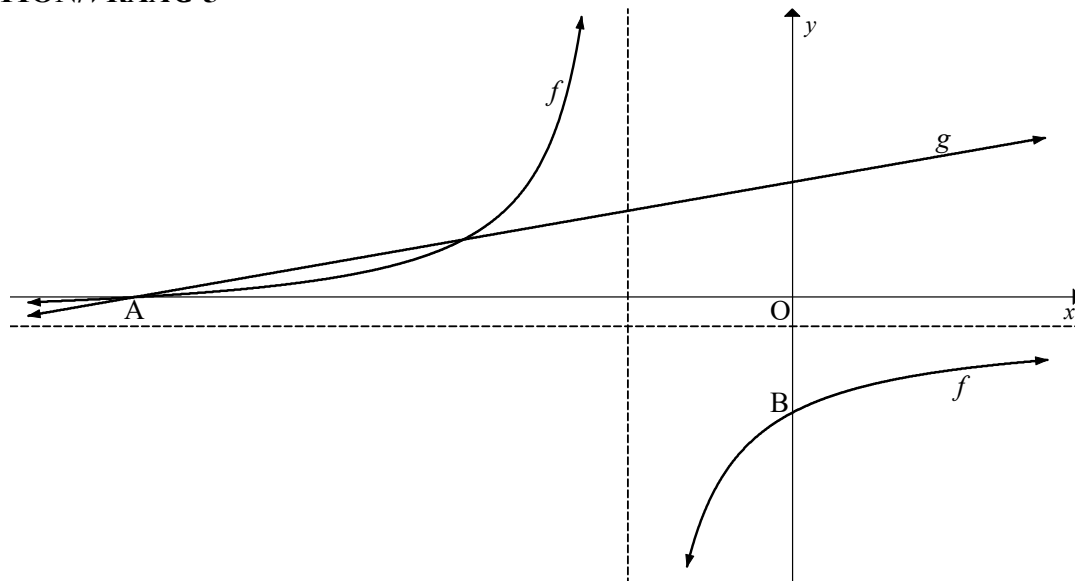
QUESTION/VRAAG 3

3.1	Clock A: 9:00 ; 9:05 ; 9:10 ; 9:15 Clock B: 9:00 ; $9:00 + (2,5)$; $9:00 + \left(\frac{1}{2}\right)(2,5)$; $9:00 + \left(\frac{1}{2}\right)^2 (2,5)$ $S_{12} = \frac{\frac{5}{2} \left[\left(\frac{1}{2} \right)^{12} - 1 \right]}{\frac{1}{2} - 1}$ $S_{12} = 4,998\dots$ ∴ time on clock B will read 9:05	✓ $n = 12$ ✓ $a = 2,5 = \frac{5}{2}$ ✓ $r = 0,5 = \frac{1}{2}$ in S_n ✓ answer ✓ time on clock B (5)
3.2	$S_\infty = \frac{a}{1-r}$ $S_\infty = \frac{2,5}{1-0,5}$ $S_\infty = 5$ Clock B will never reach the time of 9:06 because the sum to infinity is 5.	✓ $S_\infty = 5$ ✓ Never reach 9:06 (2)
		[7]

QUESTION/VRAAG 4

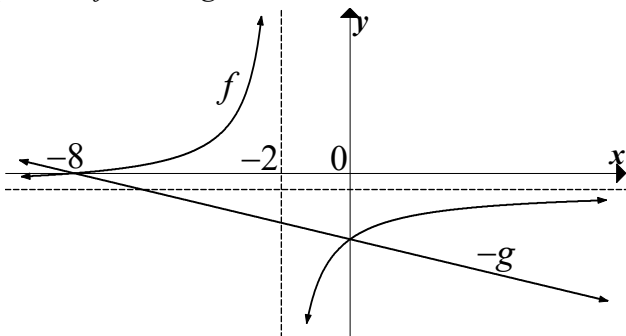
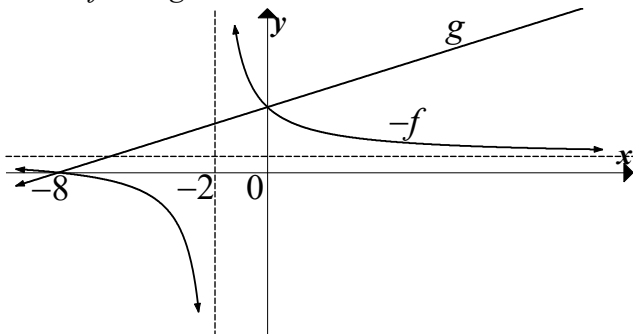
4.1	$g(x) = -x^2 + 2x + 3$ $x = \frac{-b}{2a} = \frac{-2}{2(-1)} = 1$ or $g(x) = -(x^2 - 2x) + 3$ $g(x) = -(x^2 - 2x + 1) + 3 + 1$ $g(1) = -1^2 + 2(1) + 3 = 4$ $g(x) = -(x-1)^2 + 4$ D(1 ; 4) OR/OF $g'(x) = -2x + 2 = 0$ $2x = 2$ $x = 1$ $g(1) = -1^2 + 2(1) + 3 = 4$ D(1 ; 4)	✓ method ✓ x-value ✓ y-value (3) OR/OF ✓ method ✓ x-value ✓ y-value (3)
4.2	$x < 1$ OR/OF $x \in (-\infty ; 1)$	✓ answer (1)
4.3	$-x^2 + 2x + 3 = 0$ $x^2 - 2x - 3 = 0$ $(x-3)(x+1) = 0$ $x = 3$ or $x = -1$	✓ = 0 ✓ $x = 3$ ✓ $x = -1$ (3)
4.4	$3 < k < 4$ OR/OF $k \in (3 ; 4)$	✓✓ answer (2)
4.5	$y < 4$ OR/OF $y \in (-\infty ; 4)$	✓ answer (1)

4.6	$DT = \frac{3}{2} \text{ units}$ $T = \left(1; \frac{5}{2}\right)$ $y = -a^x + 4$ $\frac{5}{2} = -a^1 + 4$ $5 = -2a + 8$ $\frac{3}{2} = a$ $\therefore f(x) = -\left(\frac{3}{2}\right)^x + 4$ OR/OF $y_g - y_f = \frac{3}{2}$ $4 - (-a + 4) = \frac{3}{2}$ $\therefore a = \frac{3}{2}$	$\checkmark \left(1; \frac{5}{2}\right)$ $\checkmark q$ $\checkmark \text{ substitute } \left(1; \frac{5}{2}\right)$ $\checkmark a$ (4) OR/OF $\checkmark y_g - y_f = \frac{3}{2}$ $\checkmark q$ $\checkmark \text{ substitute: } 4 - (-a + 4)$ $\checkmark a$ (4)
4.7	for every x-value there is a unique corresponding y – value OR/OF f is one to one relation	$\checkmark \text{ answer}$ (1) OR/OF $\checkmark \text{ answer}$ (1)
4.8	$h(x) = -f(x) + 4$ $h(x) = \left(\frac{3}{2}\right)^x$ $x = \left(\frac{3}{2}\right)^y$ $h^{-1}(x) = \log_{\frac{3}{2}} x$	$\checkmark h(x) = \left(\frac{3}{2}\right)^x$ $\checkmark \text{ swapping of } x \text{ and } y$ $\checkmark \text{ answer}$ (3)
4.9		$\checkmark x\text{-intercept}$ $\checkmark T'$ $\checkmark \text{ increasing log graph}$ (3)
		[21]

QUESTION/VRAAG 5

5.1	$x \neq -2 ; x \in R$	✓ answer (1)
5.2.1	$\frac{-6}{0+2} - 1 = y$ $y = -4$ $B(0 ; -4)$	✓ answer (1)
5.2.2	$\frac{-6}{x+2} - 1 = 0$ $-6 = 1(x+2)$ $\therefore x = -8$ $A(-8 ; 0)$ OR/OF $\frac{1}{2}x + 4 = 0$ $x = -8$ $A(-8 ; 0)$	✓ $y = 0$ ✓ answer (2) OR/OF ✓ $y = 0$ ✓ answer (2)
5.3	$y = x + c$ $-1 = (-2) + c$ $c = 1$ $\therefore y = x + 1$	✓ substitute ✓ answer (2)
5.4	$x + 1 = \frac{1}{2}x + 4$ $\frac{1}{2}x = 3$ $x = 6$ $\text{The point is } (6 ; 7)$	✓ equating ✓ x - value ✓ y - value (3)

5.5

Graphs of f and $-g$ Graphs of $-f$ and g 

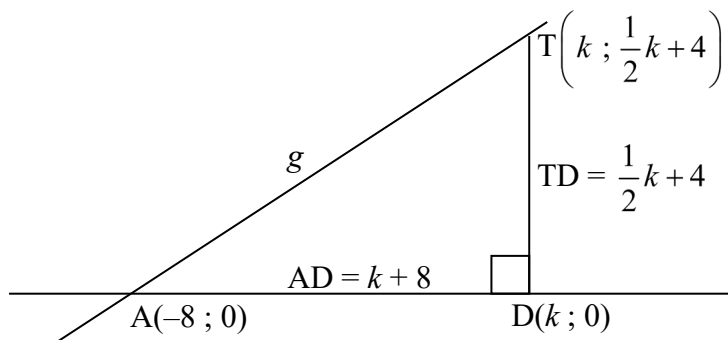
$$f(x) \geq -g(x)$$

$$-8 \leq x < -2 \text{ or } x \geq 0 \quad \text{OR/OF} \quad [-8; -2) \text{ or } [0; \infty)$$

✓✓ first interval
✓ second interval

(3)

5.6



$$\text{Area} = \frac{1}{2} \text{base} \times \text{height}$$

$$64 = \frac{1}{2}(k+8)\left(\frac{1}{2}k+4\right)$$

$$\left(\frac{1}{2}k+4\right)^2 = 64 \quad \text{or} \quad k^2 + 6k - 192 = 0$$

$$\frac{1}{2}k+4 = \pm 8 \quad \text{or} \quad (k-8)(k+24) = 0$$

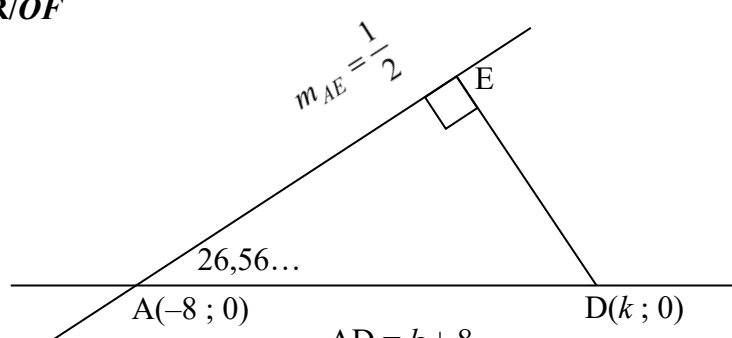
$$k = 8 \quad \text{or} \quad k = -24$$

✓ base $(k+8)$
✓ height $\left(\frac{1}{2}k+4\right)$

✓ substitution into
area formula

✓ answer

(4)

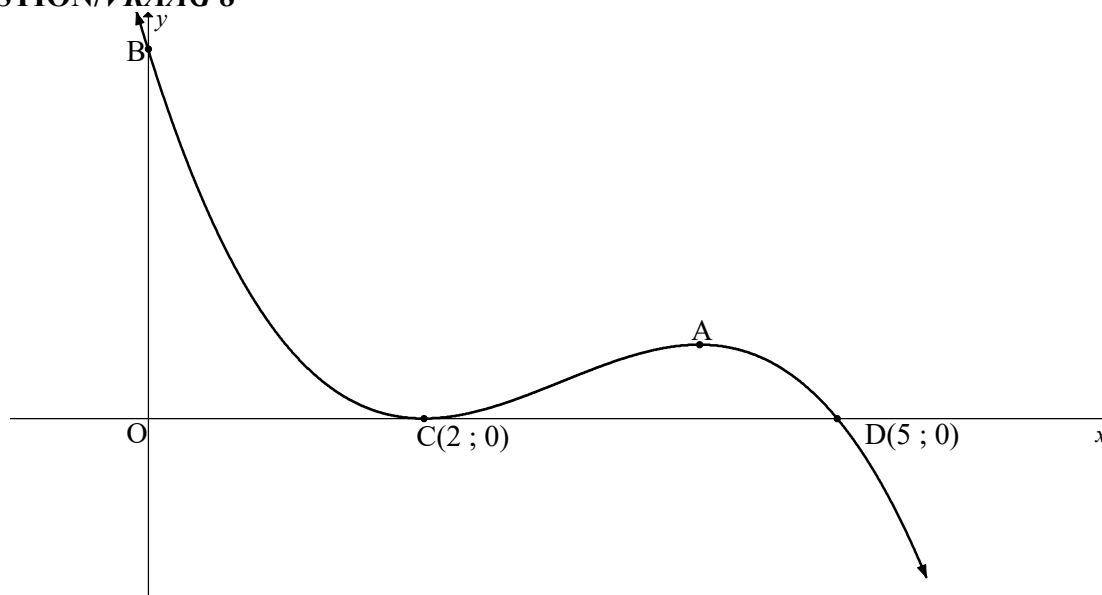
OR/OF		✓ base $(k+8)$ ✓ $AE = (k+8)\cos 26,56...^\circ$ ✓ substitution into area formula ✓ answer
		(4)
		[16]

QUESTION/VRAAG 6

6.1	$A = P(1+i)^n$ $85\,000 = 75\,000 \left(1 + \frac{r}{200}\right)^{2 \times 2}$ or $85\,000 = 75\,000 \left(1 + \frac{i}{2}\right)^{2 \times 2}$ $\frac{17}{15} = \left(1 + \frac{r}{200}\right)^4$ $\frac{17}{15} = \left(1 + \frac{i}{2}\right)^4$ $\sqrt[4]{\frac{17}{15}} = 1 + \frac{r}{200}$ $\sqrt[4]{\frac{17}{15}} = 1 + \frac{i}{2}$ $0,03178... = \frac{r}{200}$ $0,03178... = \frac{i}{2}$ $r = 6,36\%$	✓ exponent = 4 ✓ substitution of A and P into the correct formula ✓ answer (3)
6.2.1	$P = \frac{x[1 - (1+i)^{-n}]}{i}$ $P = \frac{10\,665 \left[1 - \left(1 + \frac{0,115}{12}\right)^{-240}\right]}{\frac{0,115}{12}}$ $P = R\,1\,000\,065,985$ Deposit $= \frac{1\,000\,065,985}{9} = R\,111\,118,44$	✓ $i = \frac{0,115}{12}$ ✓ $n = 240$ ✓ substitute into correct formula ✓ answer ✓ answer (5)
6.2.2 (a)	$P_v = \text{House Price} - \text{deposit}$ $P_v = R\,1\,100\,000 - R\,120\,000 = R\,980\,000$ $P_v = \frac{x[1 - (1+i)^{-n}]}{i}$ $980\,000 = \frac{11\,000 \left[1 - \left(1 + \frac{0,115}{12}\right)^{-n}\right]}{\frac{0,115}{12}}$ $\frac{-193}{1320} = -\left(1 + \frac{0,115}{12}\right)^{-n}$ $-n = \log_{\left(1 + \frac{0,115}{12}\right)} \left(\frac{193}{1320}\right)$ $\therefore n = 201,59 \text{ months}$ $\therefore n = 16,80 \text{ years} \quad (16 \text{ years and } 10 \text{ months})$	✓ Loan value ✓ substitute into correct formula ✓ simplification ✓ correct use of logs ✓ answer in years (5)
6.2.2 (b)	Amount paid $= R\,11\,000 \times 16 \times 12 + R\,120\,000$ $= R\,2\,232\,000$	✓ instalment $\times$ years $\times$ 12 ✓ + deposit ✓ answer (3)
		[16]

QUESTION/VRAAG 7

7.1	$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{(x+h)^2 + 2(x+h) - (x^2 + 2x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{x^2 + 2xh + h^2 + 2x + 2h - x^2 - 2x}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{2xh + h^2 + 2h}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{h(2x + h + 2)}{h}$ $f'(x) = \lim_{h \rightarrow 0} (2x + h + 2)$ $f'(x) = 2x + 2$ OR/OF $f(x+h) = x^2 + 2xh + h^2 + 2x + 2h$ $f(x+h) - f(x) = x^2 + 2xh + h^2 + 2x + 2h - x^2 - 2x$ $= 2xh + h^2 + 2h$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{2xh + h^2 + 2h}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{h(2x + h + 2)}{h}$ $f'(x) = \lim_{h \rightarrow 0} (2x + h + 2)$ $f'(x) = 2x + 2$	✓ $f(x+h)$ ✓ substitution ✓ simplification ✓ common factor ✓ answer (5) OR/OF ✓ $f(x+h)$ ✓ simplification ✓ substitution ✓ common factor ✓ answer (5)
7.2.1	$f(x) = x^2 - x - 6$ $f'(x) = 2x - 1$	✓ $2x$ ✓ -1 (2)
7.2.2	$\frac{d}{dx} \left(\sqrt[3]{27x^4} + \frac{2}{x^3} \right)$ $\frac{d}{dx} \left(3x^{\frac{4}{3}} + 2x^{-3} \right)$ $= 4x^{\frac{1}{3}} - 6x^{-4}$	✓ $3x^{\frac{4}{3}}$ ✓ $2x^{-3}$ ✓ $4x^{\frac{1}{3}}$ ✓ $-6x^{-4}$ (4)
7.3.1	$x = -2$ or $x = 0$	✓ answers (1)
7.3.2	$x < -1$ OR/OF $x \in (-\infty; -1)$	✓ -1 ✓ $x < -1$ (2)
7.3.3	$x < 1$ or $x > 3$ OR/OF $x \in (-\infty; 1)$ or $x \in (3; \infty)$	✓ answer ✓ answer (2)
		[16]

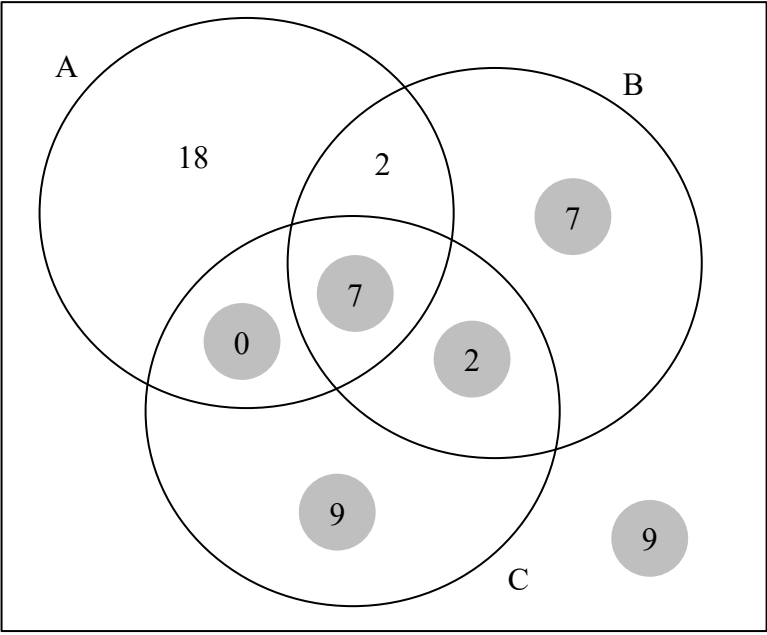
QUESTION/VRAAG 8

8.1	$h(x) = -1(x-2)^2(x-5)$ $h(x) = (-x^2 + 4x - 4)(x-5)$ $h(x) = -x^3 + 9x^2 - 24x + 20$ $\therefore p = 9 ; q = -24 ; r = 20$	$\checkmark (x-2)^2$ $\checkmark (x-5)$ $\checkmark$ expansion (3)
8.2	B (0 ; 20) OB = 20 units	$\checkmark$ OB = 20 (1)
8.3	$h'(x) = -3x^2 + 18x - 24$ $h''(x) = -6x + 18$ $-6x + 18 = 0$ $-6x = -18$ $x = 3$ $\therefore$ point of inflection is (3;2)	$\checkmark -3x^2 + 18x - 24$ $\checkmark h''(x)$ $\checkmark$ value of x $\checkmark$ value of y (4)
8.4	$m = \tan 96,34^\circ$ $m = -9$ $-9 = -3x^2 + 18x - 24$ $x^2 - 6x + 5 = 0$ $(x-5)(x-1) = 0$ $x = 5$ or $x = 1$ point of contact: (1 ; 4) $(4) = -9(1) + c$ OR/OF $y - 4 = -9(x-1)$ $c = 13$ $\therefore y = -9x + 13$ $\therefore y = -9x + 13$	$\checkmark m = -9$ $\checkmark$ equating gradients $\checkmark$ answer for x $\checkmark f(1) = 4$ $\checkmark$ answer (5)
		[13]

QUESTION/VRAAG 9

9.1	$C(0) = \frac{1}{1200}((0)^3 - 15(0)^2 + 1\,200)$ $C(0) = 1$	✓ $t = 0$ ✓ answer (2)
9.2	$C(t) = \frac{1}{1200}t^3 - \frac{1}{80}t^2 + 1$ $C'(t) = \frac{1}{400}t^2 - \frac{1}{40}t = 0$ $t^2 - 10t = 0$ $t(t - 10) = 0$ $t = 0 \text{ or/of } t = 10$ $\therefore$ minimum is at $t = 10$ days	✓ $C'(t)$ ✓ $= 0$ ✓ answer (3)
9.3	$C''(t) = \frac{1}{200}t - \frac{1}{40} = 0$ $t - 5 = 0$ $\therefore t = 5 \text{ days}$ OR/OF $t = \frac{10 + 0}{2}$ $t = 5$ OR/OF Rate of change at the endpoint $t = 15$ is the actual maximum on the domain $t \in [0 ; 15]$	✓ $C''(t)$ ✓ answer (2) OR/OF ✓ method ✓ answer (2) OR/OF ✓✓ answer (2)
		[7]

QUESTION/VRAAG 10

10.1.1	$15 \times 4 \times 16 = 960$	✓ $15 \times 4 \times 16$ (1)
10.1.2	$960 - 4 \times 4 \times 2 = 928$ OR/OF $(15)(4)(14) + (11)(4)(2)$ $= 840 + 88$ $= 928$	✓ $4 \times 4 \times 2$ ✓ answer (2) OR/OF ✓ $(15)(4)(14) + (11)(4)(2)$ ✓ answer (2)
10.1.3	$P(\text{only blue and black}) = \frac{6 \times 2 \times 3}{960} = \frac{3}{80} = 0,0375$	✓ $6 \times 2 \times 3$ ✓ $\div$ by n(s) (2)
10.2.1	$P(A \text{ and } B) = P(A) \times P(B)$ $\frac{9}{54} = \frac{x}{54} \times \frac{18}{54}$ Number of people who drink tea A = 27	✓ rule for independence ✓ $\frac{9}{54}$ ✓ answer (3)
10.2.2		✓ only A and C = 0 ✓ A and B and C ✓ only B and C ✓ only B ✓ only C ✓ complement of A or B or C (6)
		[14]

TOTAL/TOTAAL: 150