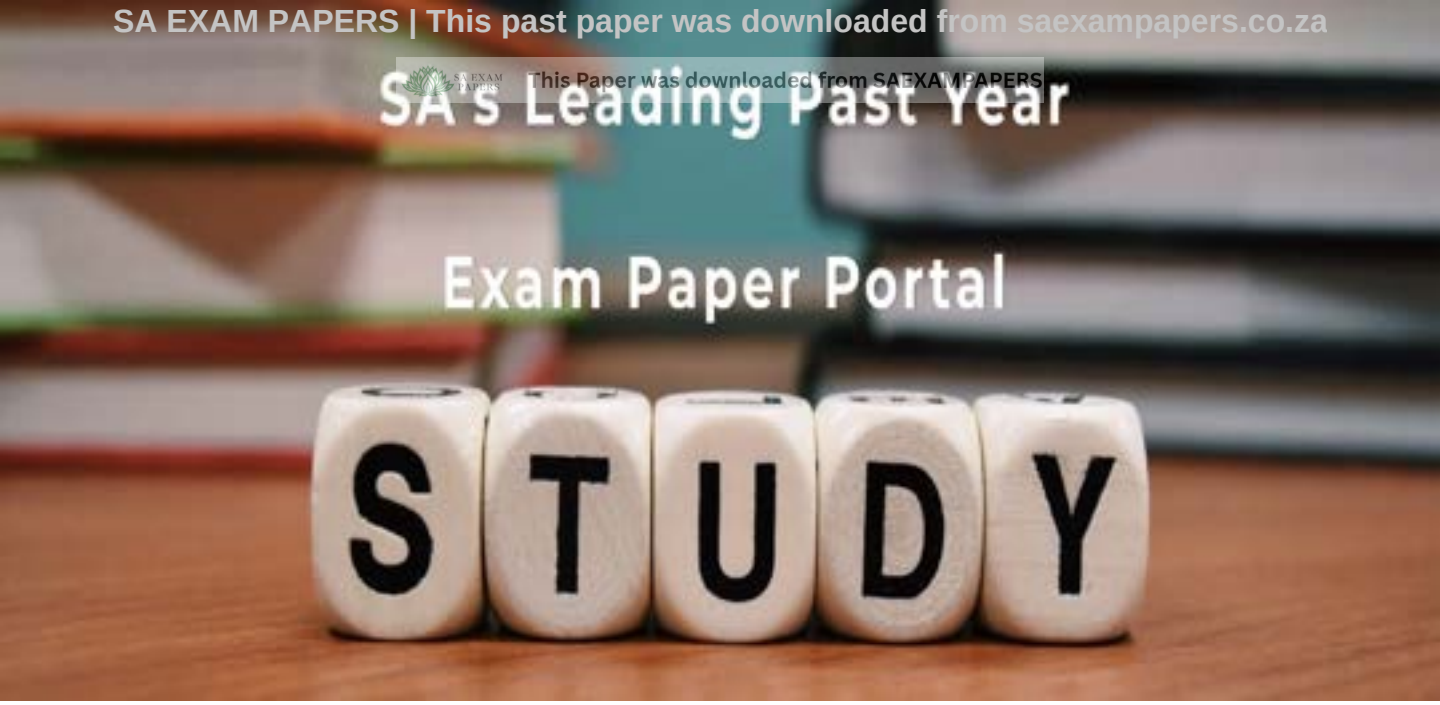


Western Cape Government

METRO NORTH EDUCATION DISTRICT

SCHOOL-BASED ASSESSMENT

SEPTEMBER TRIAL COMMON EXAMINATION

MATHEMATICS P1/ WISKUNDE V1

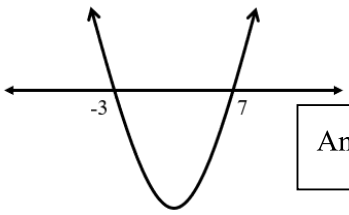
MARKING GUIDELINE/ NASIENRIGLYNE

SEPTEMBER 2025

This Marking Guideline consists of 17 pages

NOTE:
• If a candidate answers a question TWICE, only mark the FIRST attempt.
• If a candidate has crossed out an attempt of a question and not redone the question, mark the crossed out version.
• Consistent accuracy applies in ALL aspects of the marking memorandum.
• Assuming answers/values in order to solve a problem is NOT acceptable.

NOTA:
• As 'n kandidaat 'n vraag TWEEKEER beantwoord, merk slegs die EERSTE poging.
• As 'n kandidaat 'n poging om die vraag te beantwoord, doodgetrek het en nie dit oorgedoen het nie, merk die dood getrekte poging.
• Volgehoue akkuraatheid word in ALLE aspekte van die Nasien memorandum toegepas.
• Aanvaarding van antwoorde/waarde som 'n probleem op te los, is ONaanvaarbaar.

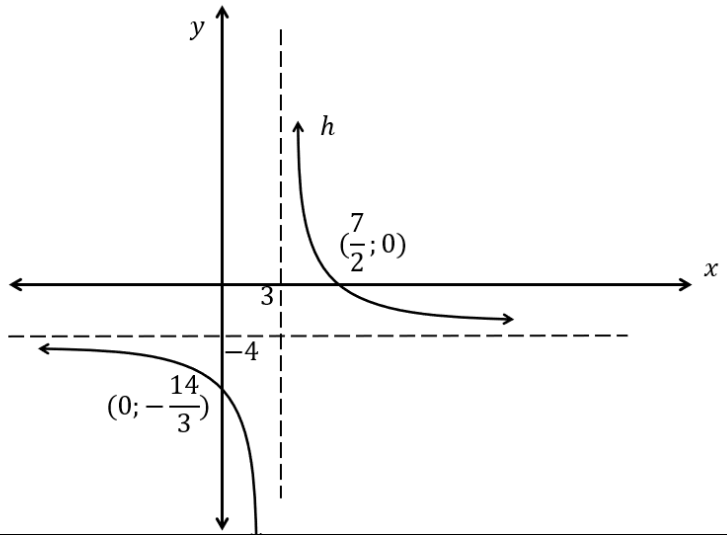
QUESTION 1		
1.1.1	$3x^2 - 7x - 6 = 0$ $(3x + 2)(x - 3) = 0$ $x = -\frac{2}{3}$ or $x = 3$ Answer only : $\frac{3}{3}$	✓ factors ✓ $x = -\frac{2}{3}$ ✓ $x = 3$ (3)
1.1.2	$2x^2 = 4 - 5x$ $2x^2 + 5x - 4 = 0$ $x = \frac{-(5) \pm \sqrt{(5)^2 - 4(2)(-4)}}{2(2)}$ $x = 0{,}64$ or $x = -3{,}14$ Answer only : $\frac{4}{4}$	✓ std form ✓ sub into correct formula ✓ $x = 0{,}64$ ✓ $x = -3{,}14$ (4)
1.1.3	$x^2 - 4x - 21 \leq 0$ $(x - 7)(x + 3) \leq 0$ CV: $x = 7$ or $x = -3$  Answer only : $\frac{2}{3}$ $-3 \leq x \leq 7$ **OR/ OF** $x \in [-3; 7]$	✓ factors / cv ✓✓ answer (3)

1.1.4	$\sqrt{2x+3} = x-1$ $\left(\sqrt{2x+3}\right)^2 = (x-1)^2$ $2x+3 = x^2-2x+1$ $x^2-4x-2=0$ $x = \frac{-(-4) \pm \sqrt{(-4)^2-4(1)(-2)}}{2(1)}$ $x = 2+\sqrt{6}$ **OR/OF** $x \neq 2-\sqrt{6}$	✓indicating to square both sides ✓std form ✓ answer with selection (3)
1.2	$2x+y=7$ $y=-2x+7$……(1) $x^2+y^2-2xy=9$ … …..(2) Sub (1) into (2): $x^2+(-2x+7)^2-2x(-2x+7)=9$ $x^2+4x^2-28x+49+4x^2-14x-9=0$ $9x^2-42x+40=0$ $(3x-10)(3x-4)=0$ $x=\frac{10}{3}$ or $x=\frac{4}{3}$ $y=-2\left(\frac{10}{3}\right)+7$ $y=-2\left(\frac{4}{3}\right)+7$ $y=\frac{1}{3}$ $y=\frac{13}{3}$ **OR/ OF** $2x+y=7$ $x=\frac{-y+7}{2}$……(1)	✓ equation 1 ✓ sub ✓ std form ✓ both x- values ✓ both $y-$ values ✓ equation 1

	$x^2 + y^2 - 2xy = 9$ ... .(2) Sub (1) into (2): $\left(\frac{-y+7}{2}\right)^2 + y^2 - 2y\left(\frac{-y+7}{2}\right) = 9$ $\frac{y^2 - 14y + 49}{4} + y^2 + y^2 - 7y - 9 = 0$ $y^2 - 14y + 49 + 4y^2 + 4y^2 - 28y - 36 = 0$ $9y^2 - 42y + 13 = 0$ $(3y - 1)(3y - 13) = 0$ $y = \frac{1}{3}$ or $y = \frac{13}{3}$ $x = \frac{-\frac{1}{3}+7}{2}$ $x = \frac{-\frac{13}{3}+7}{2}$ $x = \frac{10}{3}$ $x = \frac{4}{3}$	✓ sub ✓ std form ✓ both y- values ✓ both x – values (5)
1.3	$9^x = 45^7.15^{-y}$ $3^{2x} = (3^2.5)^7(3.5)^{-y}$ $3^{2x} = 3^{14-y}.5^{7-y}$ $3^{2x}.5^0 = 3^{14-y}.5^{7-y}$ $\therefore y = 7$ $\therefore x = 3{,}5$ $x + y = 10{,}5$	✓ prime bases ✓ simplified ✓ y ✓ x ✓ answer (5)
		[23]

QUESTION 2 / VRAAG 2		
2.1.1	$T_n = a + (n-1)d$ $167 = -7 + (n-1)(6)$ $167 = 6n - 13$ $6n = 180$ $n = 30$	✓sub into correct formula ✓answer (2)
2.1.2	$S_n = \frac{n}{2}[2a + (n-1)d]$ $8208 = \frac{n}{2}[2(-7) + (n-1)(6)]$ $16\,416 = 6n^2 - 20n$ $6n^2 - 20n - 16\,416 = 0$ $(3n + 152)(2n - 108) = 0$ $n \neq -\frac{152}{3}$ or $n = 54$	✓ sub into correct formula ✓ std form ✓ factorization ✓ both answers with selection (4)
2.2.1	$T_n = ar^{n-1}$ $T_n = x\left(\frac{x}{2}\right)^{n-1}$	✓ r ✓ answer (2)
2.2.2	$-1 < r < 1$ $-1 < \frac{x}{2} < 1$ $-2 < x < 2$	✓condition ✓answer (2)
2.2.3	$x + \frac{x^2}{2} = \frac{5}{8}$ $8x + 4x^2 = 5$ $4x^2 + 8x - 5 = 0$ $(2x - 1)(2x + 5) = 0$ $x = \frac{1}{2}$ or $x \neq -\frac{5}{2}$ $\frac{1}{2} + \frac{1}{8} + \frac{1}{32} + \cdots$ $S_\infty = \frac{a}{1-r}$ $= \frac{\frac{1}{2}}{1 - \frac{1}{4}}$ $= \frac{2}{3}$	✓ equation ✓ std from ✓ answer with selection ✓ expansion ✓ sub ✓ answer (6)
2.3.1	$(2x-1)^2$ or $4x^2 - 4x + 1$	✓ answer (1)
2.3.2	$r = 2x - 1$ $2x - 1 \neq 1$ $x \neq 1$	✓ r ✓ $r \neq 1$ ✓ answer (3)
		[20]

QUESTION 3 / VRAAG 3		
3.1	$T_n = 1 + (9 - 1)(0{,}75)$ $= 7$ km	✓ sub a and d into correct formula ✓ answer (2)
3.2	Week in which 10 km will be run: $10 = 0{,}75n + 0{,}25$ $n = 13$ Weeks that Tania does not run 10 km = First 12 weeks $S_{12} = \frac{12}{2}[2(1) + (12 - 1)(0{,}75)]$ $= 61{,}5\ km$ ∴ Total distance for 24 weeks $= S_{12} + 12(10)$ $= 61{,}5 + 120$ $= 181{,}5$ km **OR/OF** $10 = 0{,}75n + 0{,}25$ $n = 13$ $S_{13} = \frac{13}{2}[2(1) + (13 - 1)(0{,}75)]$ $= 71{,}5$ km Total distance $= S_{13} + 11(10)$ $= 71{,}5 + 110$ $= 181{,}5$ km	✓$T_n = 10$ ✓n ✓ sub ✓answer ✓ answer ✓$T_n = 10$ ✓ n ✓ sub ✓ answer ✓ answer (5)
		[7]

QUESTION 4 / VRAAG 4		
4.1	$x = 3$ $y = -4$	✓ $x = 3$ ✓ $y = -4$ (2)
4.2	$0 = \frac{2}{x-3} - 4$ $4 = \frac{2}{x-3}$ $4x - 12 = 2$ $4x = 14$ $x = \frac{7}{2}$	✓ $y = 0$ ✓ answer (2)
4.3		✓ asymptotes ✓ x-intercept ✓ y-intercept ✓ shape (4)
4.4	$x < 3$ or $x \geq \frac{7}{2}$ **OR/OF** $(-\infty;3) \cup [\frac{7}{2};\infty)$	✓ $x < 3$ ✓ $x \geq \frac{7}{2}$ (2)
		[10]

QUESTION 5 / VRAAG 5		
5.1	$B(-6;0)$ $D(4;0)$	✓ $B(-6;0)$ ✓ $D(4;0)$ (2)
5.2	$c = 8$ $m = \dfrac{8-0}{0-4}$ $m = -2$	✓ $c = 8$ ✓ sub into m ✓ $m = -2$ (3)
5.3	$(x-4)(x+6) = -2x+8$ $x^2 + 2x - 24 + 2x - 8 = 0$ $x^2 + 4x - 32 = 0$ $(x+8)(x-4) = 0$ $x = -8$ or $x = 4$ $y = -2(-8) + 8$ $y = 24$ $A(-8;24)$ $A'(24;-8)$	✓ equation ✓ std form ✓ factors ✓ $A(-8;24)$ ✓ $A'(24;-8)$ (5)
5.4	$f(x) = (x-4)(x+6)$ $f(x) = x^2 + 2x - 24$ $f'(x) = 2x + 2$ $m = -2$ $2x + 2 = -2$ $2x = -4$ $x = -2$ $y = (-2)^2 + 2(-2) - 24$ $y = -24$ $(-2;-24)$ $g(x) = -2x + 8 - k$ $(-2;-24)$: $-24 = -2(-2) + 8 - k$ $k = 36$ **OR/OF** $x^2 + 2x - 24 = -2x + 8 - k$ $x^2 + 4x - 32 + k = 0$ $\Delta = (4)^2 - 4(1)(-32 + k)$ $-4k + 144 = 0$ $-4k = -144$ $k = 36$	✓$f'(x) = 2x + 2$ ✓ $2x + 2 = -2$ ✓ $(-2;-24)$ ✓ sub of $(-2;-24)$ ✓ $k = 36$ ✓ equating ✓ std form ✓ discriminant ✓ condition ✓ answer (5)
		[15]

QUESTION 6/ VRAAG 6		
6.1	$3 = 2^0 + q$ $q = 2$	✓ substation of $(0; 3)$ ✓ $q = 2$ (2)
6.2	$k(x) = 2^x$ $x = 2^y$ $y = \log_2 x$	✓ $k(x)$ ✓ swop x and y ✓ $y = \log_2 x$ (3)
6.3.1	$0 < x \leq 1$ **OR/OF** $(0; 1]$	✓✓ answer (2)
6.3.2	$x > 6$ **OR/OF** $(6; \infty)$	✓✓ answer (2)
6.4	$h(x) = -2^{x+3} + 2$	✓ -2^{x+3} ✓+2 (2)
		[11]

QUESTION 7/ VRAAG 7		
7.1	$A = P(1-i)^n$ $A = 85\,000\,(1-0.085)^5$ $A = R\,54\,516{,}05$	✓ sub into correct formula ✓ answer (2)
7.2	$F_v = \frac{x[(1+i)^n - 1]}{i}$ $180\,000 = \frac{4\,494{,}35[\left(1+\frac{0{,}072}{12}\right)^n - 1]}{\frac{0{,}072}{12}}$ $\frac{180\,000(\frac{0{,}072}{12})}{4\,494{,}35} + 1 = \left(1+\frac{0{,}072}{12}\right)^n$ $\log_{(1+\frac{0{,}072}{12})} 1{,}2403017121 = n$ $n = 36\ or\ 37$	✓$i = \frac{0{,}072}{12}$ ✓ sub into F_v ✓ correct use of logs ✓ answer (4)
7.3.1	Monthly instalment $P_v = \frac{x[1-(1+i)^{-n}]}{i}$ $350\,000 = \frac{x[1-\left(1+\frac{0{,}115}{12}\right)^{-180}]}{\frac{0{,}115}{12}}$ $x = \frac{350\,000(\frac{0{,}115}{12})}{[1-\left(1+\frac{0{,}115}{12}\right)^{-180}]}$ $x = R4088{,}66$ Outstanding balance after 5 years $P_v = \frac{4088{,}66[1-\left(1+\frac{0{,}115}{12}\right)^{-120}]}{\frac{0{,}115}{12}}$ $P_v = R290\,810{,}28$ Outstanding balance after lump sum payment: $R290\,810{,}28 - R40\,000 = R\,250\,810{,}28$ **OR/OF** Monthly instalment	✓ $i = \frac{0{,}115}{12}$ ✓ $n = -180$ ✓sub into P_v formula ✓ answer ✓$n = -120$ ✓answer

	$\frac{x[\left(1+\frac{0,115}{12}\right)^{180}-1]}{\frac{0,115}{12}} = 350\,000\left(1+\frac{0,115}{12}\right)^{180}$ $x = \frac{350\,000\left(1+\frac{0,115}{12}\right)^{180}(\frac{0,115}{12})}{[\left(1+\frac{0,115}{12}\right)^{180}-1]}$ $x = R4\,088,66$ Outstanding balance after 5 years $A - F$ $= 350\,000\left(1+\frac{0,115}{12}\right)^{60} - \frac{4088,66[\left(1+\frac{0,115}{12}\right)^{60}-1]}{\frac{0,115}{12}}$ $= 290\,810,93$ Outstanding balance after lump sum payment: $R290\,810,93 - R40\,000 = R\,250\,810,93$	✓ $i = \frac{0,115}{12}$ ✓ n in both ✓sub into F_v ✓ answer ✓$n = 60$ ✓$OB = R250\,810,93$ (6)
7.3.2	$250\,810,28\left(1+\frac{0,115}{12}\right)^{8} = \frac{x[1-\left(1+\frac{0,115}{12}\right)^{-112}]}{\frac{0,115}{12}}$ $x = \frac{250\,810,28\left(1+\frac{0,115}{12}\right)^{8}(\frac{0,115}{12})}{[1-\left(1+\frac{0,115}{12}\right)^{-112}]}$ $x = R3\,952,24$ **OR/ OF** $250\,810,28\left(1+\frac{0,115}{12}\right)^{120} = \frac{x[\left(1+\frac{0,115}{12}\right)^{112}-1]}{\frac{0,115}{12}}$ $x = \frac{250\,810,28\left(1+\frac{0,115}{12}\right)^{120}(\frac{0,115}{12})}{[\left(1+\frac{0,115}{12}\right)^{112}-1]}$ $x = R3\,952,24$	✓ n=8 in A formula ✓$n = -112$ in P_v ✓ sub into both formula ✓ answer ✓ n=120 in A formula ✓$n = 112$ in F_v ✓ sub into both formula ✓ answer (4)
		[16]

QUESTION 8		
8.1	$f(x) = 3 - x^2$ $f(x+h) = 3 - (x+h)^2$ $= 3 - x^2 - 2xh - h^2$ $f(x+h) - f(x) = 3 - x^2 - 2xh - h^2 - (3 - x^2)$ $= -2xh - h^2$ $f'(x) = \lim_{h \to 0} \frac{-2xh - h^2}{h}$ $f'(x) = \lim_{h \to 0} \frac{h(-2x - h)}{h}$ $f'(x) = \lim_{h \to 0} -2x - h$ $f'(x) = -2x$ **OR/OF** $f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \to 0} \frac{3 - (x+h)^2 - (3 - x^2)}{h}$ $f'(x) = \lim_{h \to 0} \frac{3 - x^2 - 2xh - h^2 - 3 + x^2}{h}$ $f'(x) = \lim_{h \to 0} \frac{-2xh - h^2}{h}$ $f'(x) = \lim_{h \to 0} \frac{h(-2x - h)}{h}$ $f'(x) = \lim_{h \to 0} -2x - h$ $f'(x) = -2x$	✓ $3 - x^2 - 2xh - h^2$ ✓ $-2xh - h^2$ ✓ sub into correct formula ✓ factor of h ✓answer ✓ sub into correct formula ✓ $3 - x^2 - 2xh - h^2$ ✓ $-2xh - h^2$ ✓ factor of h ✓answer (5)
8.2.1	$\frac{d}{dx}(3x^4 - 7x^{-2})$ $= 12x^3 + 14x^{-3}$	✓$12x^3$ ✓$+14x^{-3}$ (2)
8.2.2	$f(x) = (2x^3 - 1)^2$ $= 4x^6 - 4x^3 + 1$ $f'(x) = 24x^5 - 12x^2$	✓ simplification ✓ $24x^5$ ✓$12x^2$ (3)

8.2.3	$Dx\left[\frac{x^4-m}{x^2-\sqrt{m}}\right]$ $= Dx\frac{(x^2+\sqrt{m})(x^2-\sqrt{m})}{x^2-\sqrt{m}}$ $= Dx(x^2+\sqrt{m})$ $= 2x$	✓ $factors$ ✓ simplification ✓ $answer$ (3)
8.3.1	$f'(x) = 3ax^2 + 2bx$ $f'(-1) = 0$ $3a(-1)^2 + 2b(-1) = 0$ $3a - 2b = 0 \ldots\ldots\ldots\ldots (1)$ $f(-1) = -1$ $a(-1)^3 + b(-1)^2 - 2 = -1$ $-a + b - 2 = -1$ $b = a + 1 \ldots\ldots\ldots\ldots\ldots (2)$ $3a - 2(a+1) = 0$ $3a - 2a - 2 = 0$ $a = 2$ $b = 2 + 1$ $b = 3$	✓ $f'(-1) = 0$ ✓ equation 1 ✓ equation 2 ✓ method (4)
8.3.2	$f'(x) = 6x^2 + 6x$ $f''(x) = 12x + 6$ $12x + 6 = 0$ $x = -\frac{1}{2}$ $x > -\frac{1}{2}$	✓$f''(x) = 0$ ✓ x ✓ answer (3)
8.3.3	$-1 < x < 0$ or $x > 0$ **OR/OF** $x > -1; x \neq 0$	✓ $-1 < x < 0$ ✓ $x > 0$ **OR/OF** ✓ $x > -1$ ✓ $x \neq 0$ (2)

8.4	$f(x) = -x^2 - 1$ Tangent AB: $m = f'(3)$ $f'(x) = -2x$ $f'(3) = -2(3)$ $= -6$ **AB:** $y = -6x + c$ $(3; -10): -10 = -6(3) + c$ $8 = c$ $\therefore y = -6x + 8$ Coordinate of B: $0 = -6x + 8$ $x = \frac{4}{3}$ $B(\frac{4}{3}; 0)$ and $T(3; 0)$ BT $= 1\frac{2}{3}$ AT $= 10$ $AB^2 = (10)^2 + \left(1\frac{2}{3}\right)^2$ AB= 10,14 **OR/OF** $(x) = -x^2 - 1$ Tangent AB: $m = f'(3)$ $f'(x) = -2x$ $f'(3) = -2(3)$ $= -6$ **AB:** $y = -6x + c$ $(3; -10): -10 = -6(3) + c$ $8 = c$ $\therefore y = -6x + 8$ Coordinate of B: $0 = -6x + 8$ $x = \frac{4}{3}$ $B(\frac{4}{3}; 0)$ AB= $\sqrt{\left(3 - \frac{4}{3}\right)^2 + (-10 - 0)^2}$ $= 10,14$	✓ $f'(x) = -2x$ ✓ $f'(3) = -6$ ✓ c ✓ x – value of B ✓ sub in Pyth ✓answer ✓ $f'(x) = -2x$ ✓ $f'(3) = -6$ ✓ c ✓ x – value of B ✓ sub in distance ✓answer (6)
		[28]

QUESTION 9		
9.1	$h(2) = 9(2) - 2(2)^2$ $= 10m$	✓A (1)
9.2	Speed $= h'(x)$ $h'(x) = 9 - 4t$ $h'(2) = 9 - 4(2)$ $= 1m/s$	✓ $h'(x) = 9 - 4t$ ✓ $h'(2)$ ✓ answer (3)
9.3	$9t - 2t^2 = 0$ $t(9 - 2t) = 0$ $t = 0$ or $t = 4.5$ $\therefore t = 4{,}5$	✓ $9t - 2t^2 = 0$ ✓ $t = 4{,}5$ (2)
		[6]

QUESTION 10		
10.1.1	P(A or B) = P(A) + P(B) – P(A and B) $0,73 = 0,55 + 0,4 - P$ (A and B) P (A and B) $= 0,22$ P (A and B) $\neq 0$ ∴ A and B are not mutually exclusive	✓ P (A and B) $= 0,22$ ✓ P (A and B) $\neq 0$ ∴ A and B are not mutually exclusive (2)
10.1.2	P(A) × P(B) $= 0,55 \times 0,4$ $= 0,22$ P (A and B) $= 0,22$ P (A and B) $=$ P(A) × P(B) ∴ A and B are independent events	✓ P(A) × P(B) $= 0,55 \times 0,4$ ✓ P(A) × P(B) $= 0,22$ ✓ P (A and B) $=$ P(A) × P(B) ∴ A and B are independent events (3)
10.2.1	$6 + 69 - x + 8 + x + 73 - x + 17 + 5 + 4 = 120$ $182 - x = 120$ $x = 62$	✓ equation ✓A (2)
10.2.2	P(R and C) $= \frac{73}{120}$ or 0,6083 or 60,83%	✓✓ answer (2)
10.3.1	26 26 10 9 8 = 486 720	✓ 26 26 ✓ 10 9 8 (2)
10.3.2	1 25 6 5 2 = 1500 ∴ There will not be enough codes for the sign ups	✓ 1 25 ✓6 5 2 ✓ conclusion (3)
		[14]
	TOTAL 150	