



**education**

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 10**

**MATHEMATICS P1**

**MEMORANDUM**

**2007**

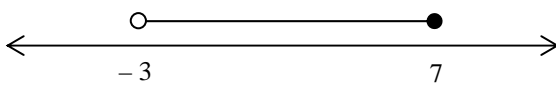
**MARKS: 100**

**This memorandum consists of 6 pages.**

**QUESTION 1**

1.1.1	$(2x + 1)(7x^2 - 3x - 4)$ $= 14x^3 + x^2 - 11x - 4$	✓ first and last terms ✓✓ one mark for each middle term (3)
1.1.2	$\frac{(2^{x+1})^3}{\sqrt{64^x}}$ $= \frac{2^{3x+3}}{\sqrt{2^{6x}}}$ $= \frac{2^{3x+3}}{2^{3x}}$ $= 2^3$ $= 8$	✓ $2^{3x+3}$ ✓ $2^{3x}$ ✓ $2^3$ ✓ answer (4)
1.2.1	$x^2 + 7x - 8$ $= (x + 8)(x - 1)$	✓✓ factors (2)
1.2.2	$ax - 2bx - ay + 2by$ $= x(a - 2b) - y(a - 2b)$ $= (x - y)(a - 2b)$	✓✓ common factors ✓ factors (3) <b>[12]</b>

**QUESTION 2**

2.1.1	$x(2x - 3) = 2$ $2x^2 - 3x - 2 = 0$ $(2x + 1)(x - 2) = 0$ $x = -\frac{1}{2}$ or $x = 2$	✓ standard form ✓ factors ✓✓ answers (4)
2.1.2	$3^x = 25$ $3^2 = 9$ and $3^3 = 27 \therefore x$ is between 2 and 3 $\therefore x \approx 2,93$	✓ reasoning ✓ answer (2)
2.1.3	(a) $-5 < \frac{3x - 1}{2} \leq 10$ $-10 < 3x - 1 \leq 20$ $-9 < 3x \leq 21$ $-3 < x \leq 7$ (b) 	✓ multiplication by 2 ✓ simplification ✓ answer for inequality (3) ✓✓ graph (1 mark for correct critical pts) (1 mark for solid line) (2)

2.2		Speed	Distance	Time	✓ $90 - x$
	Tortoise	0,05	$x$	$20x$	✓ $\frac{90 - x}{7}$
	Rabbit	7	$90 - x$	$\frac{90 - x}{7}$	✓ $20x$
	$\frac{90 - x}{7} = 20x$ $90 - x = 140x$ $90 = 141x$ $x = 0,64$ The hedgehog has moved 0,64 metres				✓ equation  ✓ answer
					(5) <b>[18]</b>

**QUESTION 3**

3.1	$x + y = 250$	✓ answer	(1)
3.2	$20x + 30y$	✓ answer	(1)
3.3	$y = 250 - x$ $20x + 30y = 5500$ $20x + 30(250 - x) = 5500$ $20x + 7500 - 30x = 5500$ $-10x = -2000$ $x = 200$ $y = 50$	✓ expressing $y$ in terms of $x$ ✓ setting up equation ✓ substitution  ✓ value of $x$ ✓ value of $x$	(5) <b>[7]</b>

**QUESTION 4**

4.1	29	✓ answer (1)
4.2	The number of sticks is equal to the pattern number times 8 plus 1	✓ ✓ answer (2)
4.3	$T_n = 7n + 1$	✓ ✓ answer (2)
4.4	$351 = 7n + 1$ $350 = 7n$ $n = 50$	✓ substitution  ✓ answer (2) <b>[7]</b>

**QUESTION 5**

5.1	32 ; 64	✓ ✓ answer (2)
5.2	2;    4;    8;    16 $2^1$ $2^2$ $2^3$ $2^4$ $T_n = 2^n$	✓ ✓ powers ✓ answer (3)
5.3	$2^{20} = 1048576$	✓ $2^{20}$ ✓ answer (2) <b>[7]</b>

**QUESTION 6**

6.1.1	$A = 5600(1 + 0,038)^3$ $A = R6262,97$	✓ substitution ✓ 0,038 ✓ 3 ✓ answer (4)
6.1.2	$P = 6262,97 + 2100$ $P = 8362,97$ $A = 8362,97(1 + 0,038)^2$ $A = R9010,63$	✓ + 2100 ✓ answer ✓ substitution  ✓ answer (4)
6.2.1	1 euro = R 9,5970 $\frac{4500}{9,5970} = 468,90$ euros	✓ substitution ✓ ✓ answer (3)
6.2.2	$105 \times 0,658$ $= \text{£ } 69,09$	✓ substitution ✓ answer (2)
6.3	$684(1 + 1 \times 0,1)$ $= R752,40$ $752,40(1 - 1 \times 0,15)$ $= R6639,54$	✓ substitution ✓ answer ✓ substitution ✓ answer (4) <b>[15]</b>

**QUESTION 7**

7.1		<ul style="list-style-type: none"> <li>✓ y-intercept of parabola</li> <li>✓ x-intercepts of parabola</li> <li>✓ shape of parabola</li> <li>✓ y-intercept of straight line</li> <li>✓ x-intercept of straight line</li> <li>✓ slope</li> </ul> <p style="text-align: right;">(6)</p>
7.2.1	$x = 0$ or $x = -2$	<ul style="list-style-type: none"> <li>✓✓ answers</li> </ul> <p style="text-align: right;">(2)</p>
7.2.2	$-2 < x < 2$	<ul style="list-style-type: none"> <li>✓✓ answer</li> </ul> <p style="text-align: right;">(2)</p>
7.3	Shift the graph of $g$ up vertically by 7 units	<ul style="list-style-type: none"> <li>✓ shifted up</li> <li>✓ 7 units</li> </ul> <p style="text-align: right;">(2)</p> <p style="text-align: right;"><b>[12]</b></p>

**QUESTION 8**

8.1	$y = 1$	<ul style="list-style-type: none"> <li>✓ answer</li> </ul> <p style="text-align: right;">(1)</p>
8.2	$y > 1$  OR $y \in (1; \infty)$	<ul style="list-style-type: none"> <li>✓ answer</li> </ul> <p style="text-align: right;">(1)</p>
8.3	$x \in \mathbb{R} - \{0\}$ OR $x \in \mathbb{R}; x \neq 0$	<ul style="list-style-type: none"> <li>✓✓ answer</li> </ul> <p style="text-align: right;">(2)</p>
8.4	$4 = a^1 + 1$ $a = 3$	<ul style="list-style-type: none"> <li>✓✓ substitution</li> <li>✓ answer</li> </ul> <p style="text-align: right;">(3)</p>
8.5	$k = 4$	<ul style="list-style-type: none"> <li>✓ answer</li> </ul> <p style="text-align: right;">(1)</p>
8.6	$h(x) = -\frac{4}{x}$	<ul style="list-style-type: none"> <li>✓✓ answer</li> </ul> <p style="text-align: right;">(2)</p> <p style="text-align: right;"><b>[10]</b></p>

**QUESTION 9**

9.1	Period = $180^\circ$	✓✓ answer (2)
9.2	$q = -1$	✓ answer (1)
9.3	$a = 1$	✓ answer (1)
9.4	$y \in [-2 ; 0]$	✓✓ answer (2)
9.5	$x \in (-90^\circ ; 0^\circ]$	✓✓ answer (2)
		<b>[8]</b>

**QUESTION 10**

10.1	Between March and April	✓ answer (1)
10.2	Between May and June	✓ answer (1)
10.3	Average rate of change in rainfall = $\frac{200 - 50}{5}$ $= 30$	✓ change in y ✓ change in x ✓ answer (3)
		<b>[5]</b>