

SA's Leading Past Year

Exam Paper Portal

STUDY

You have Downloaded, yet Another Great Resource to assist you with your Studies 😊

Thank You for Supporting SA Exam Papers

Your Leading Past Year Exam Paper Resource Portal

Visit us @ [www.saexampapers.co.za](http://www.saexampapers.co.za)



SA EXAM  
PAPERS



**education**

**Lefapha la Thuto la Bokone Bophirima  
Noordwes Departement van Onderwys  
North West Department of Education  
NORTH WEST PROVINCE**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**MATHEMATICS P1  
SEPTEMBER 2022  
MARKING GUIDELINES**

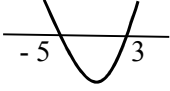
**MARKS: 150**

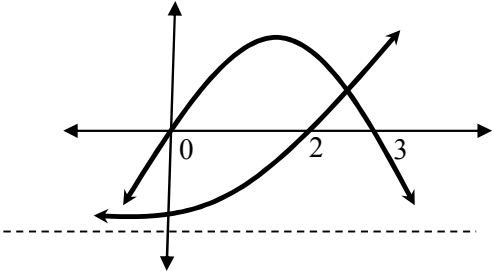
**These marking guidelines consist of 15 pages, and a cognitive grid of 2 pages.**

**NOTE:**

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

**QUESTION 1**

<p>1.1.1</p>	$(3x - 1)(x + 2) = 0$ $3x = 1 \quad \text{or} \quad x = -2$ $x = \frac{1}{3}$	<p>✓ <math>x = -2</math></p> <p>✓ <math>x = \frac{1}{3}</math></p> <p style="text-align: right;">(2)</p>
<p>1.1.2</p>	$5x^2 - 7x - 11 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(5)(-11)}}{2(5)}$ $x = 2,34 \quad \text{or} \quad x = -0,94$	<p>✓ substitution into correct formula</p> <p>✓ <math>x = 2,34</math> ✓ <math>x = -0,94</math></p> <p style="text-align: right;">(3)</p>
<p>1.1.3</p>	$x^2 + 2x - 15 \geq 0$ $(x + 5)(x - 3) \geq 0$ $\therefore x \leq -5 \quad \text{or} \quad x \geq 3$	<div style="text-align: center;">  </div> <p>✓ factors</p> <p>✓ critical values</p> <p>✓ <math>x \leq -5</math> ✓ <math>x \geq 3</math></p> <p style="text-align: right;">(4)</p>
<p>1.2</p>	$x + 2y = 3$ $x = 3 - 2y$ $x^2 - y^2 = x + y$ $(3 - 2y)^2 - y^2 = (3 - 2y) + y$ $9 - 12y + 4y^2 - y^2 - 3 + y = 0$ $3y^2 - 11y + 6 = 0$ $(y - 3)(3y - 2) = 0$ $y = 3 \quad \text{or} \quad y = \frac{2}{3}$ $x = 3 - 2(3) \quad \text{or} \quad x = 3 - 2\left(\frac{2}{3}\right)$ $= -3 \qquad \qquad \qquad = \frac{5}{3}$ <p><b>OR</b></p>	<p>✓ <math>x = 3 - 2y</math></p> <p>✓ substitution</p> <p>✓ standard form</p> <p>✓ factors/formula</p> <p>✓ both y-values</p> <p>✓ both x-values</p> <p style="text-align: right;">(6)</p>

	$x + 2y = 3$ $2y = 3 - x$ $y = \frac{3 - x}{2}$ $x^2 - y^2 = x + y$ $x^2 - \left(\frac{3 - x}{2}\right)^2 = x + \left(\frac{3 - x}{2}\right)$ $x^2 - \left(\frac{9 - 6x + x^2}{4}\right) = x + \left(\frac{3 - x}{2}\right)$ $4x^2 - 9 + 6x - x^2 = 4x + 6 - 2x$ $3x^2 + 4x - 15 = 0$ $(3x - 5)(x + 3) = 0$ $x = \frac{5}{3} \quad \text{or} \quad x = -3$ $y = \frac{3 - \frac{5}{3}}{2} \quad y = \frac{3 - (-3)}{2}$ $= \frac{2}{3} \quad = 3$	$\checkmark y = \frac{3 - x}{2}$ $\checkmark \text{substitution}$ $\checkmark \text{standard form}$ $\checkmark \text{factors/formula}$ $\checkmark \text{both } x\text{-values}$ $\checkmark \text{both } y\text{-values}$ <p style="text-align: right;">(6)</p>
1.3.1	$3x - x^2 = 0$ $x(3 - x) = 0$ $x = 0 \quad \text{or} \quad x = 3$	$\checkmark 3x - x^2 = 0$ $\checkmark \text{factors}$ $\checkmark \text{both answers}$ <p style="text-align: right;">(3)</p>
1.3.2	$2^x - 4 = 0$ $2^x = 4$ $2^x = 2^2$ $x = 2$	$\checkmark 2^x - 4 = 0$ $\checkmark x = 2$ <p style="text-align: right;">(2)</p>
1.3.3	 $\frac{3x - x^2}{2^x - 4} \leq 0$ $\therefore \text{signs differ}$ $\therefore 0 \leq x < 2 \quad \text{or} \quad x \geq 3$	$\checkmark \text{sketch/method}$ $\checkmark 0 \leq x < 2 \quad \checkmark x \geq 3$ <p style="text-align: right;">(3) <b>[23]</b></p>

**QUESTION 2**

2.1.1	$S_n = 3n^2 + 2n$ $S_{10} = 3(10)^2 + 2(10)$ $= 320$	✓ substitution ✓ answer (2)
2.1.2	$S_1 = 3(1)^2 + 2(1) \quad S_2 = 3(2)^2 + 2(2)$ $= 5 \quad \quad \quad = 16$ $S_3 = 3(3)^2 + 2(3)$ $= 33$ $T_1 = S_1 = 5$ $T_2 = S_2 - S_1 = 16 - 5$ $= 11$ $T_3 = S_3 - S_2 = 33 - 16$ $= 17$ $\therefore 5 + 11 + 17 \dots$	✓ $S_2 = 16$ & $S_3 = 33$ ✓ $T_1 = 5$ ✓ $T_2 = 11$ ✓ $T_3 = 17$ (4)
2.1.3	Arithmetic	✓ answer (1)
2.1.4	$T_n = a + (n - 1)d$ $161 = 5 + (n - 1)(6)$ $156 = (n - 1)(6)$ $26 = n - 1$ $n = 27$ $\therefore \text{there are } 27 \text{ terms in the series}$	✓ substitution ✓ simplification ✓ answer (3)

2.2	$S_{\infty} = \frac{a}{1 - r}$ $18 = \frac{a}{1 - r}$ $18(1 - r) = a$ $S_n = \frac{a(1 - r^n)}{1 - r}$ $\frac{130}{9} = \frac{a(1 - r^4)}{1 - r}$ $\frac{130}{9} = \frac{18(1 - r)(1 - r^4)}{1 - r}$ $\frac{65}{81} = 1 - r^4$ $r^4 = \frac{16}{81}$ $r = \pm \frac{2}{3}$	<p>✓ equation</p> <p>✓ <math>a</math> subject</p> <p>✓ equation</p> <p>✓ substitution of <math>a</math></p> <p>✓ simplification</p> <p>✓ answer</p>
		<p>(6) <b>[16]</b></p>

**QUESTION 3**

3.1	Black : 5; 6; 7	<p>✓ sequence</p> <p style="text-align: right;">(1)</p>
3.2	$T_n = n + 4$	<p>✓ answer</p> <p style="text-align: right;">(1)</p>
3.3	$6^2 - 8$ $= 28$	<p>✓ <math>6^2 - 8</math></p> <p>✓ answer</p> <p style="text-align: right;">(2)</p>
3.4	<p>White:</p> $  \begin{array}{cccc}  4 & 10 & 18 & 28 \\  \swarrow & \swarrow & \swarrow & \\  6 & 8 & 10 & \\  \swarrow & \swarrow & & \\  2 & 2 & &   \end{array}  $ $2a = 2$ $a = 1$ $3a + b = T_2 - T_1$ $3(1) + b = 6$ $b = 3$	<p>✓ <math>a = 1</math></p> <p>✓ <math>b = 3</math></p>

	$a + b + c = T_1$ $1 + 3 + c = 4$ $c = 0$ $\therefore T_n = n^2 + 3n$	$\checkmark c = 0$  (3)
3.5	$T_n = n + 4$ $32 = n + 4$ $\therefore n = 28$ $T_n = n^2 + 3n$ $= (28)^2 + 3(28)$ $= 868$	$\checkmark n = 28$  $\checkmark$ substitution $\checkmark$ answer  (3) <b>[10]</b>

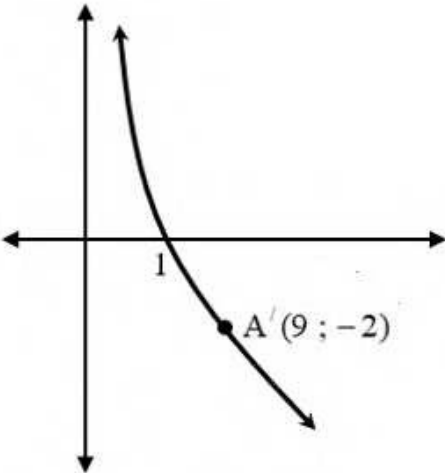
**QUESTION 4**

4.1	$x \in \mathbb{R}; x \neq 0$  <b>OR</b>  $x \in (-\infty ; 0) \cup (0 ; \infty)$	$\checkmark x \in \mathbb{R} \checkmark x \neq 0$  (2)  $\checkmark (-\infty ; 0) \checkmark (0 ; \infty)$  (2)
4.2	$y = x + 8$ $7 = m + 8$ $m = -1$	$\checkmark$ substitution $\checkmark$ answer  (2)
4.3	$n = 8$	$\checkmark$ answer  (1)
4.4	$p = 1; q = 8$	$\checkmark p = 1 \checkmark q = 8$  (2)
4.5	$f(x) = -2x^2 - 4x + 6$ $0 = -2x^2 - 4x + 6$ $0 = x^2 + 2x - 3$ $0 = (x + 3)(x - 1)$ $x = -3 \text{ or } x = 1$	$\checkmark f(x) = 0$  $\checkmark$ factors/formula $\checkmark$ both answers  (3)
4.6	$E(-1 ; 7)$ therefore $D(-1 ; y)$ $y = \frac{-3}{-1} + 8$ $= 11$ $\therefore D(-1 ; 11)$	$\checkmark$ substitution  $\checkmark$ answer  (2)

4.7	$g(x) = -\frac{3}{x} + 8$ $= -3x^{-1} + 8$ $g'(x) = 3x^{-2}$ $= \frac{3}{x^2}$ $g'(-1) = \frac{3}{(-1)^2}$ $= 3$ $y - y_1 = m(x - x_1)$ $y - 11 = 3(x + 1)$ $y = 3x + 14$	$\checkmark -3x^{-1}$ $\checkmark g'(x) = 3x^{-2}$  $\checkmark$ substitution  $\checkmark$ substitution $\checkmark$ answer  (5)
4.8	$y = \frac{3}{x-4} + 8$	$\checkmark 3 \checkmark x - 4$  $\checkmark y = \frac{3}{x-4} + 8$  (3)
4.9	<p><math>g</math> shifts 4 units left</p> <p><math>\therefore D'(-5 ; 11)</math> with an asymptote at <math>y = 8</math></p> <p><math>\therefore g</math> must shift more than 8 units down, but less than 11 units down.</p> $8 < -k < 11$ $-11 < k < -8$	$\checkmark D'(-5 ; 11)$  $\checkmark 8$ $\checkmark$ notation  (3) <b>[23]</b>



**QUESTION 5**

<p>5.1</p>	$f : y = 2x^2; y \geq 0$ $f^{-1} : x = 2y^2$ $y^2 = \frac{x}{2}$ $y = \pm \sqrt{\frac{x}{2}}; x \geq 0$	<ul style="list-style-type: none"> <li>✓ swop <math>x</math> and <math>y</math></li> <li>✓ answer for <math>y</math></li> <li>✓ restriction for <math>x</math></li> </ul> <p style="text-align: right;">(3)</p>
<p>5.2</p>	 <p><math>A'(9; -2)</math> <math>\therefore 1 \leq x \leq 9</math></p>	<ul style="list-style-type: none"> <li>✓ <math>A'(9; -2)</math></li> <li>✓ 1</li> <li>✓ notation</li> </ul> <p style="text-align: right;">(3)</p>
<p>5.3</p>	$f\left(\frac{1}{x}\right) + \frac{1}{f(x)} + [f^{-1}(x)]^2$ $= 2\left(\frac{1}{x}\right)^2 + \frac{1}{2x^2} + \frac{x}{2}$ $= \frac{2}{x^2} + \frac{1}{2x^2} + \frac{x}{2}$ $= \frac{5 + x^3}{2x^2}$	<ul style="list-style-type: none"> <li>✓ <math>2\left(\frac{1}{x}\right)^2</math> ✓ <math>\frac{1}{2x^2}</math></li> <li>✓ answer</li> </ul> <p style="text-align: right;">(3) <b>[9]</b></p>

**QUESTION 6**

6.1	$1 + i_{eff} = \left(1 + \frac{i_{nom}}{m}\right)^m$ $= \left(1 + \frac{0,13}{12}\right)^{12}$ $= 1,138032482$ $\therefore i_{eff} = 0,1380$ $\therefore r = 13,80\%$	<ul style="list-style-type: none"> <li>✓ substitution</li> <li>✓ simplification</li>   <li>✓ answer</li> </ul> <p style="text-align: right;">(3)</p>
6.2	$F = \frac{x \left[ (1 + i)^n - 1 \right]}{i}$ $1\,800\,000 = \frac{x \left[ \left(1 + \frac{0,13}{12}\right)^{133} - 1 \right]}{\frac{0,13}{12}}$ $x = R\,6\,109,77$	<ul style="list-style-type: none"> <li>✓ <math>i = \frac{0,13}{12}</math></li> <li>✓ <math>n = 133</math></li> <li>✓ substitution</li>   <li>✓ answer</li> </ul> <p style="text-align: right;">(4)</p>
6.3	<p>Future shortage because of the withdrawals</p> $= 20\,000 \left(1 + \frac{0,13}{12}\right)^{6 \times 12} + 20\,000 \left(1 + \frac{0,13}{12}\right)^{4 \times 12} +$ $20\,000 \left(1 + \frac{0,13}{12}\right)^{2 \times 12}$ $= R\,102\,895,78$	<ul style="list-style-type: none"> <li>✓ substitution into the correct formula</li> <li>✓ <math>n = 6 \times 12</math></li> <li>✓ <math>n = 4 \times 12</math></li> <li>✓ <math>n = 2 \times 12</math></li> <li>✓ answer</li> </ul> <p style="text-align: right;">(5)</p>
6.4	$F = \frac{x \left[ (1 + i)^n - 1 \right]}{i}$ $1\,800\,000 + 102\,895,78 = \frac{x \left[ \left(1 + \frac{0,13}{12}\right)^{133} - 1 \right]}{\frac{0,13}{12}}$ $x = R\,6\,459,03$	<ul style="list-style-type: none"> <li>✓ enlarged F value</li> <li>✓ substitution into correct formula</li>   <li>✓ answer</li> </ul> <p style="text-align: right;">(3) <b>[15]</b></p>

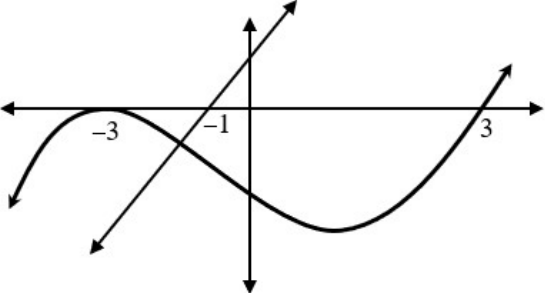
**QUESTION 7**

<p>7.1</p>	$f(x) = 5x^2 - x + 3$ $f(x + h) = 5(x + h)^2 - (x + h) + 3$ $= 5(x^2 + 2xh + h^2) - x - h + 3$ $= 5x^2 + 10xh + 5h^2 - x - h + 3$ $f(x + h) - f(x) = (5x^2 + 10xh + 5h^2 - x - h + 3) - (5x^2 - x + 3)$ $= 10xh + 5h^2 - h$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x + h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{10xh + 5h^2 - h}{h}$ $= \lim_{h \rightarrow 0} \frac{h(10x + 5h - 1)}{h}$ $= \lim_{h \rightarrow 0} (10x + 5h - 1)$ $= 10x - 1$ <p><b>OR</b></p> $f(x) = 5x^2 - x + 3$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x + h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{[5(x + h)^2 - (x + h) + 3] - (5x^2 - x + 3)}{h}$ $= \lim_{h \rightarrow 0} \frac{5(x^2 + 2xh + h^2) - x - h + 3 - 5x^2 + x - 3}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{5x^2 + 10xh + 5h^2 - x - h + 3 - 5x^2 + x - 3}{h}$ $= \lim_{h \rightarrow 0} \frac{10xh + 5h^2 - h}{h}$ $= \lim_{h \rightarrow 0} \frac{h(10x + 5h - 1)}{h}$ $= \lim_{h \rightarrow 0} (10x + 5h - 1)$ $= 10x - 1$	<p>✓ <math>5(x + h)^2 - (x + h) + 3</math></p> <p>✓ simplification</p> <p>✓ simplification</p> <p>✓ substitution into formula</p> <p>✓ factors</p> <p>✓ answer</p> <p style="text-align: right;">(6)</p> <p>✓ <math>5(x + h)^2 - (x + h) + 3</math></p> <p>✓ substitution into formula</p> <p>✓ simplify <math>f(x + h)</math></p> <p>✓ simplification</p> <p>✓ factors</p> <p>✓ answer</p> <p style="text-align: right;">(6)</p>
<p>7.2</p>	$\frac{d}{dt} [(2t - 1)(t + 4)]$ $= \frac{d}{dt} [2t^2 + 7t - 4]$ $= 4t + 7$	<p>✓ simplification</p> <p>✓ 4t ✓ 7</p> <p style="text-align: right;">(3)</p>

7.3	$9p^2 - 3pq - q = 1$ $9p^2 - 1 = 3pq + q$ $9p^2 - 1 = q(3p + 1)$ $q = \frac{9p^2 - 1}{3p + 1}$ $= \frac{(3p + 1)(3p - 1)}{3p + 1}$ $= 3p - 1$ $\frac{dq}{dp} = 3$	✓ factorise $q$ ✓ factorise $p$  ✓ expression for $q$ ✓ answer  (4) <b>[13]</b>
-----	-------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------

**QUESTION 8**

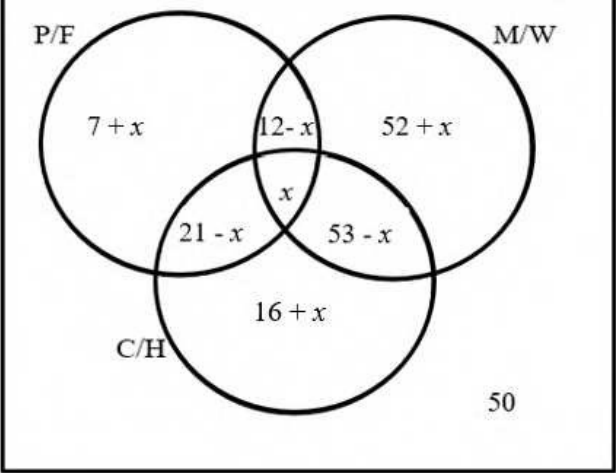
8.1	$f''(x) = 6x + 6$	✓ $6x$ ✓ $6$  (2)
8.2	$x = -1$	✓ answer  (1)
8.3	$x > -1$ The graph is concave up when $f''(x) > 0$ Thus concave up where the graph of $f''(x)$ lies above the $x$ -axis.	✓ answer  ✓ reason  (2)
8.4	$f(x) = px^3 + qx^2 + rx - 27$ $f'(x) = 3px^2 + 2qx + r$ $f''(x) = 6px + 2q$ $\therefore 6p = 6 \quad 2q = 6$ $p = 1 \quad q = 3$ $f'(x) = 3(1)x^2 + 2(3)x + r$ $= 3x^2 + 6x + r$ $0 = 3(1)^2 + 6(1) + r$ $r = -9$	✓ $f'(x) = 3px^2 + 2qx + r$ ✓ $f''(x) = 6px + 2q$ ✓ $6p = 6$ ✓ $2q = 6$  ✓ $f'(1) = 0$  (5)
8.5	$f'(x) = 3x^2 + 6x - 9$ $0 = 3t^2 + 6t - 9$ $0 = t^2 + 2t - 3$ $0 = (t + 3)(t - 1)$ $t = -3 \quad \text{or} \quad t = 1$ <p style="text-align: center;">n.a</p> <p><b>OR</b></p>	✓ $f'(x) = 3x^2 + 6x - 9$ ✓ $f'(x) = 0$  ✓ only $t = -3$  (3)

	$f(x) = x^3 + 3x^2 - 9x - 27$ $f(3) = (3)^3 + 3(3)^2 - 9(3) - 27$ $= 0$ <p><math>\therefore x - 3</math> is a factor of <math>f(x)</math></p> $\therefore f(x) = (x - 3)(x^2 + 6x + 9)$ $= (x - 3)(x + 3)(x + 3)$ <p><math>\therefore x = 3</math> or <math>x = -3</math> or <math>x = -3</math></p> <p><math>x</math>-intercepts repeat</p> <p><math>\therefore x = -3</math> is the turning point</p> <p><math>\therefore t = -3</math></p>	<p>✓ <math>x</math>-intercepts</p> <p>✓ <math>x = -3</math> is turning point</p> <p>✓ <math>t = -3</math></p> <p>(3)</p>
<p>8.6</p>	 <p><math>x \leq -1</math> or <math>x \geq 3</math></p>	<p>✓ <math>x</math>-intercept: <math>x = 3</math></p> <p>✓ <math>x = -3</math></p> <p>✓ graph of <math>f</math></p> <p>✓ <math>x \leq -1</math> ✓ <math>x \geq 3</math></p> <p>(5) <b>[18]</b></p>

**QUESTION 9**

9.1	$h(x) = -x^2 + 4x - 3$ $h'(x) = -2x + 4$	✓ answer  (1)
9.2	$\frac{-x^2 + 4x - 3}{x} = -2x + 4$ $-x^2 + 4x - 3 = -2x^2 + 4x$ $x^2 - 3 = 0$ $x^2 = 3$ $x = \pm \sqrt{3}$ $\therefore x = \sqrt{3}$ $\therefore m = -2(\sqrt{3}) + 4$ $= 0,54$ $\therefore \tan \theta = 0,54$ $\theta = 28,19^\circ$ $\therefore \text{The soldier must use an angle of } 28,19^\circ$ <p><b>OR</b></p> $y = mx \quad y = -x^2 + 4x - 3$ $mx = -x^2 + 4x - 3$ $x^2 - 4x + mx + 3 = 0$ $x^2 + (m - 4)x + 3 = 0$ $\Delta = b^2 - 4ac$ $= (m - 4)^2 - 4(1)(3)$ To touch $\Delta = 0$ $0 = m^2 - 8m + 16 - 12$ $0 = m^2 - 8m + 4$ $m = \frac{8 \pm \sqrt{(-8)^2 - 4(1)(4)}}{2(1)}$ $m = 7,46 \quad \text{or} \quad m = 0,54$ n.a $\therefore \tan \theta = 0,54$ $\theta = 28,19^\circ$ $\therefore \text{The soldier must use an angle of } 28,19^\circ$	✓ equation  ✓ standard form  ✓ x-value  ✓ gradient ✓ $\tan \theta = 0,54$ ✓ answer          ✓ equating  ✓ standard form      ✓ $\Delta = 0$   ✓ value for $m$  ✓ $\tan \theta = 0,54$ ✓ answer   (6) <b>[7]</b>

**QUESTION 10**

10.1		<p>7 values need to be placed in the correct position:</p> <p>1 or 2 correct: 1 mark  3 or 4 correct: 2 marks  5 or 6 correct: 3 marks  7 correct: 4 marks</p> <p style="text-align: right;">(4)</p>
10.2	$50 + 7 + x + 12 - x + x + 21 - x + 52 + x + 53 - x + 16 + x = 220$ $211 + x = 220$ $x = 9$	<p>✓ equation</p> <p>✓ answer</p> <p style="text-align: right;">(2)</p>
10.3	$P(M \text{ or } P \text{ or } C) = \frac{61 + 16 + 25}{220}$ $= \frac{102}{220} = \frac{51}{110} = 0,46$	<p>✓ <math>\frac{61 + 16 + 25}{220}</math></p> <p>✓ answer</p> <p style="text-align: right;">(2)</p> <p style="text-align: right;"><b>[8]</b></p>

**QUESTION 11**

11.1	$(10)(9!)(9) = 32\,659\,200$	✓ (10)(9) ✓ 9! (2)
11.2	$\frac{(2)(1)(5)(4)(7!)}{2(9!)}$ $= \frac{201\,600}{725\,760}$ $= \frac{5}{18}$	✓ (2)(1) ✓ (5)(4) ✓ 7! ✓ ✓ 2(9!)
		✓ answer (6) <b>[8]</b>
<b>TOTAL:</b>		<b>150</b>



**COGNITIVE LEVELS**

**MATHEMATICS P1**

QUESTION	COGNITIVE LEVELS				TOPICS						TOTAL MARKS
	LEVEL 1 (20%)	LEVEL 2 (35%)	LEVEL 3 (30%)	LEVEL 4 (15%)	ALGEBRA	PATTERNS	FUNCTIONS	FINANCE	DIFFERENTIATION	PROBABILITY	
1.1.1	2				2						
1.1.2	3				3						
1.1.3		4			4						
1.2		6			6						
1.3.1		3			3						
1.3.2		2			2						
1.3.3			3		3						23
2.1.1	2					2					
2.1.2		4				4					
2.1.3	1					1					
2.1.4		3				3					
2.2			6			6					16
3.1	1					1					
3.2	1					1					
3.3				2		2					
3.4			3			3					
3.5				3		3					10
4.1	2						2				
4.2		2					2				
4.3	1						1				
4.4	2						2				
4.5		3					3				
4.6	2						2				
4.7			5				5				
4.8	3						3				
4.9				3			3				23
5.1		3					3				
5.2			3				3				
5.3			3				3				9
6.1		3						3			
6.2		4						4			
6.3				5				5			
6.4			3					3			15
7.1		6							6		
7.2		3							3		
7.3				4					4		13
8.1	2								2		
8.2	1								1		
8.3	2								2		

8.4			5					5			
	COGNITIVE LEVELS				TOPICS						
	LEVEL 1 (25%)	LEVEL 2 (30%)	LEVEL 3 (30%)	LEVEL 4 (15%)							
QUESTION	KNOWLEDGE	ROUTINE PROCEDURES	COMPLEX PROCEDURES	PROBLEM SOLVING	ALGEBRA	PATTERNS	FUNCTIONS	FINANCE	DIFFERENTIATION	PROBABILITY	TOTAL MARKS
8.5		3							3		
8.6			5						5		18
9.1		1							1		
9.2				6					6		7
10.1	4									4	
10.2		2								2	
10.3	2									2	8
11.1			2							2	
11.2			6							6	9
<b>TOT</b>	<b>31</b>	<b>52</b>	<b>44</b>	<b>23</b>	<b>23</b>	<b>26</b>	<b>32</b>	<b>15</b>	<b>38</b>	<b>16</b>	<b>150</b>
<b>%</b>	<b>20.7%</b>	<b>34.7%</b>	<b>29.3%</b>	<b>15.3%</b>							
<b>Pol</b>	<b>20%</b>	<b>35%</b>	<b>30%</b>	<b>15%</b>	<b>25</b>	<b>25</b>	<b>35</b>	<b>15</b>	<b>35</b>	<b>15</b>	<b>150</b>