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Noordwes Departement van Onderwys
North West Department of Education
NORTH WEST PROVINCE**

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**MATHEMATICS P1
SEPTEMBER 2020
MARKING GUIDELINES**

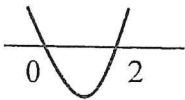
MARKS: 150

These marking guidelines consist of 16 pages and two pages with cognitive levels.

NOTE:

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

QUESTION 1

<p>1.1.1</p>	$9x^2 - 7x - 3 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(9)(-3)}}{2(9)}$ $= \frac{7 \pm \sqrt{157}}{18}$ <p>$x = 1,08$ or $x = -0,31$</p>	<p>✓ substitution into the correct formula</p> <p>✓ $x = 1,08$ ✓ $x = -0,31$</p> <p>(3)</p>
<p>1.1.2</p>	$5x^2 - 10x > 0$ $5x(x - 2) > 0$ <p>$5x < 0$ or $x > 2$</p> <p>∴ $x < 0$ or $x > 2$</p> 	<p>✓ factors/critical values</p> <p>✓ ✓ $x < 0$ or $x > 2$</p> <p>(3)</p>
<p>1.1.3</p>	$4 - \sqrt{x + 5} = x + 3$ $4 - x - 3 = \sqrt{x + 5}$ $(1 - x)^2 = x + 5$ $1 - 2x + x^2 = x + 5$ $x^2 - 3x - 4 = 0$ $(x - 4)(x + 1) = 0$ <p>$x = 4$ or $x = -1$</p> <p><i>n.a.</i></p>	<p>✓ root the subject</p> <p>✓ square both sides</p> <p>✓ standard form</p> <p>✓ factors/formula</p> <p>✓ both answers</p> <p>✓ selection</p> <p>(6)</p>
<p>1.2.1</p>	<p>$y = 4: (x - 3)(4 + 4) = 0$</p> $(x - 3) = 0$ $x = 3$	<p>✓ $x = 3$</p> <p>(1)</p>
<p>1.2.2</p>	<p>$y = -4: (x - 3)(-4 + 4) = 0$</p> $(x - 3)(0) = 0$ $x \in \mathbb{R}$	<p>✓ $x \in \mathbb{R}$</p> <p>(1)</p>



1.3	$2y + x = 1$ $x = 1 - 2y$ $x^2 + y^2 = y - x$ $(1 - 2y)^2 + y^2 = y - (1 - 2y)$ $1 - 4y + 4y^2 + y^2 = y - 1 + 2y$ $5y^2 - 7y + 2 = 0$ $(5y - 2)(y - 1) = 0$ $5y = 2 \quad \text{or} \quad y = 1$ $y = \frac{2}{5}$ $x = 1 - 2\left(\frac{2}{5}\right) \quad x = 1 - 2(1)$ $= \frac{1}{5} \quad = -1$ <p>OR</p> $2y = 1 - x$ $y = \frac{1 - x}{2}$ $x^2 + \left(\frac{1 - x}{2}\right)^2 = \frac{1 - x}{2} - x$ $x^2 + \left(\frac{1 - 2x + x^2}{4}\right) = \frac{1 - x}{2} - x$ $4x^2 + 1 - 2x + x^2 = 2(1 - x) - 4x$ $4x^2 + 1 - 2x + x^2 = 2 - 2x - 4x$ $5x^2 + 4x - 1 = 0$ $(5x - 1)(x + 1) = 0$ $5x = 1 \quad \text{or} \quad x = -1$ $x = \frac{1}{5}$ $y = \frac{2}{5} \quad y = 1$	$\checkmark x = 1 - 2y$ \checkmark substitution \checkmark standard form \checkmark factors/formula \checkmark both y-values \checkmark both x-values (6)
1.4	$5x^2 - kx + 16 = (x + 2) \cdot Q(x) + 10$ <p>Say $f(x) = 5x^2 - kx + 16$</p> $f(-2) = 5(-2)^2 - k(-2) + 16$ $10 = 20 + 2k + 16$ $-26 = 2k$ $-13 = k$	\checkmark substitution $\checkmark f(-2) = 10$ \checkmark answer (3) [23]

QUESTION 2

2.1.1	$1; 1,25; 1,5; \dots$ $T_n = a + (n - 1)d$ $T_{10} = 1 + (9)(0,25)$ $= 3,25 \text{ hours}$	✓ sequence ✓ substitution ✓ answer (3)
2.1.2	$6 = 1 + (n - 1)(0,25)$ $5 = (n - 1)(0,25)$ $20 = n - 1$ $21 = n$ $\therefore \text{on } 21^{\text{st}} \text{ day}$	✓ substitution ✓ answer (2)
2.1.3	$S_n = \frac{n}{2}[2a + (n - 1)d]$ $S_{21} = \frac{21}{2}[2(1) + (21 - 1)(0,25)]$ $= 73,5$ Day 22 to 30 $= (9)(6)$ $= 54$ Total hours = $73,5 + 54$ $= 127,5 \text{ hours}$	✓ substitution ✓ 73,5 ✓ 54 ✓ answer (4)
2.2	AS : $\log x + \log y + \log z$ $\therefore T_2 - T_1 = T_3 - T_2$ $\log y - \log x = \log z - \log y$ $\log \frac{y}{x} = \log \frac{z}{y}$ $\frac{y}{x} = \frac{z}{y}$ $\therefore \frac{T_2}{T_1} = \frac{T_3}{T_2}$ $\therefore \text{Geometric sequence: } x; y; z$	✓ $\log y - \log x = \log z - \log y$ ✓ $\log \frac{y}{x} = \log \frac{z}{y}$ ✓ $\frac{y}{x} = \frac{z}{y}$ ✓ $\frac{T_2}{T_1} = \frac{T_3}{T_2}$ (4) [13]



QUESTION 3

3.1.1	$64 + 32 + 16 + \dots$ $r = \frac{32}{64} = \frac{1}{2}$ $T_n = ar^{n-1}$ $T_9 = 64 \left(\frac{1}{2}\right)^{9-1}$ $= \frac{1}{4}$	<p>✓ $r = \frac{1}{2}$</p> <p>✓ substitution</p> <p>✓ answer</p> <p style="text-align: right;">(3)</p>
3.1.2	$S_\infty = \frac{a}{1-r}$ $= \frac{64}{1 - \frac{1}{2}}$ $= 128$	<p>✓ substitution</p> <p>✓ answer</p> <p style="text-align: right;">(2)</p>
3.2.1	<p>1st differences: $T_n = 6n + 8$</p> $ \begin{array}{ccc} 14 & 20 & 26 \\ \swarrow & & \searrow \\ & 6 & 6 \end{array} $ <p style="margin-left: 100px;">1st differences</p> <p style="margin-left: 100px;">2nd difference</p> $2a = 6$ $a = 3$	<p>✓ 1st differences</p> <p>✓ 2nd difference</p> <p>✓ $2a = 6$</p> <p style="text-align: right;">(3)</p>
3.2.2	$T_2 - T_1 = 3a + b$ $14 = 3(3) + b$ $5 = b$ $T_1 = a + b + c$ $2 = 3 + 5 + c$ $-6 = c$ $\therefore T_n = 3n^2 + 5n - 6$	<p>✓ $b = 5$</p> <p>✓ $c = -6$</p> <p>✓ $T_n = 3n^2 + 5n - 6$</p> <p style="text-align: right;">(3)</p>
3.3	$\sum_{r=5}^{17} (3r + 2) p^{r+3} k^{20-r}$ <p>OR</p> $\sum_{r=8}^{20} (3r - 7) p^r k^{23-r}$ <p>OR</p> $\sum_{r=1}^{13} (3r + 14) p^{r+7} k^{16-r}$	<p>✓ $\sum_{r=\text{begin}}^{\text{end}}$</p> <p>✓ general term</p> <p>✓ exponent of p</p> <p>✓ exponent of k</p> <p style="text-align: right;">(4)</p> <p style="text-align: right;">[15]</p>

QUESTION 4

4.1	$f(x) = -x^2 - 6x - 4$ $x = -\frac{b}{2a}$ OR $f'(x) = -2x - 6$ $= -\frac{(-6)}{2(-1)}$ $0 = -2x - 6$ $= -3$ $x = -3$ $y = -(-3)^2 - 6(-3) - 4$ $= 5$ $\therefore A(-3; 5)$	\checkmark substitution / $f'(x) = 0$ \checkmark $x = -3$ \checkmark $y = 5$ (3)
4.2	B(0; -4)	\checkmark $y = -4$ (1)
4.3	$f(x) = -x^2 - 6x - 4$ $0 = -x^2 - 6x - 4$ $x = \frac{6 \pm \sqrt{(-6)^2 - 4(-1)(-4)}}{2(-1)}$ $x = -0,76$ or $x = -5,24$	\checkmark $y = 0$ \checkmark substitution \checkmark both x answers (3)
4.4	$g(x) = \frac{2}{x+3} - 4$	\checkmark $x + 3$ \checkmark $\frac{2}{x+3} - 4$ (2)
4.5	$y = (x + 3) - 4$ $= x + 3 - 4$ $= x - 1$ OR $y = x + c$ $-4 = -3 + c$ $c = -1$ $y = x - 1$	\checkmark substitution \checkmark answer OR \checkmark substitution \checkmark answer (2)

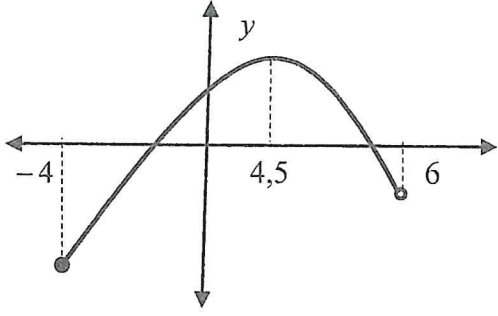


4.6	$x - 1 = \frac{2}{x + 3} - 4$ $x + 3 = \frac{2}{x + 3}$ $(x + 3)^2 = 2$ $x^2 + 6x + 9 = 2$ $x^2 + 6x + 7 = 0$ $x = \frac{-6 \pm \sqrt{6^2 - 4(1)(7)}}{2(1)}$ $x = -1,59 \quad \text{or} \quad x = -4,41$ <p style="text-align: center;"><i>n.a.</i></p> $y = -1,59 - 1$ $= -2,59$ $\therefore (-1,59; -2,59)$	<p>✓ equating</p> <p>✓ simplify</p> <p>✓ standard form</p> <p>✓ $x = -1,59$</p> <p>✓ y answer</p> <p style="text-align: right;">(5)</p>
4.7	$y - y_1 = m(x - x_1)$ $y + 2,59 = -(x + 1,59)$ $y = -x - 1,59 - 2,59$ $y = -x - 4,18$	<p>✓ $m = -1$</p> <p>✓ substitution</p> <p>✓ answer</p> <p style="text-align: right;">(3)</p>
4.8	$[-5,24; -3] \quad \text{or} \quad [-0,76; \infty)$ <p>OR</p> $-5,24 \leq x \leq -3 \quad \text{or} \quad -0,76 \leq x$	<p>✓ $[-5,24; -3]$</p> <p>✓ $[-0,76; \infty)$</p> <p>OR</p> <p>✓ $-5,24 \leq x \leq -3$</p> <p>✓ $-0,76 \leq x$</p> <p style="text-align: right;">(2)</p> <p style="text-align: right;">[21]</p>

QUESTION 5

5.1	$0 = -\frac{2}{3}x + 3$ $\frac{2}{3} = 3$ $x = \frac{9}{2} = 4,5$	$\checkmark y = 0$ $\checkmark x = \frac{9}{2} = 4,5$ (2)
5.2	$k(x) = -\frac{2}{3}x + 3; -4 \leq x < 6$ $k(-4) = -\frac{2}{3}(-4) + 3 \quad k(6) = -\frac{2}{3}(6) + 3$ $= 5,67 \quad = -1$ $\therefore -1 < x \leq 5,67$ <p>OR</p> $x \in (-1; 5,67]$	\checkmark critical values \checkmark notation (2) OR \checkmark critical values \checkmark notation (2)
5.3	$h: y = \left(\frac{1}{2}\right)^x$ $h^{-1}: x = \left(\frac{1}{2}\right)^y$ $y = \log_{\frac{1}{2}} x$ <p>OR</p> $h: y = 2^{-x}$ $h^{-1}: x = 2^{-y}$ $-y = \log_2 x$ $y = -\log_2 x$	\checkmark swop x and y \checkmark answer OR \checkmark swop x and y \checkmark answer (2)
5.4	(1; 0)	$\checkmark x = 1$ $\checkmark y = 0$ (2)
5.5	$3 < x \leq 5,67$ <p>OR</p> $x \in (3; 5,67]$	\checkmark critical values \checkmark notation (2) OR \checkmark critical values \checkmark notation (2)



5.6		<ul style="list-style-type: none"> ✓ turning point at $x = 4,5$ ✓ x-values of end points ✓ form <p style="text-align: right;">(3) [13]</p>
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QUESTION 6

6.1	$F = \frac{x \left[(1 + i)^n - 1 \right]}{i}$ $3\,000\,000 = \frac{x \left[\left(1 + \frac{0,1}{12} \right)^{241} - 1 \right]}{\frac{0,1}{12}}$ $x = R\,3\,912,89$	<ul style="list-style-type: none"> ✓ $n = 241$ ✓ $i = \frac{0,1}{12}$ ✓ substitution in correct formula ✓ answer <p style="text-align: right;">(4)</p>
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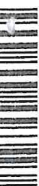
6.2	$A = P(1 + i)^n$ $= 3\,000\,000 \left(1 + \frac{0,08}{12}\right)^3$ $= R3\,060\,400,889$ $P = \frac{x[1 - (1 + i)^{-n}]}{i}$ $3\,060\,400,889 = \frac{20\,600 \left[1 - \left(1 + \frac{0,08}{12}\right)^{-n}\right]}{\frac{0,08}{12}}$ $0,9904209997 = 1 - \left(1 + \frac{0,08}{12}\right)^{-n}$ $\left(1 + \frac{0,08}{12}\right)^{-n} = 1 - 0,9904209997$ $\log_{\left(1 + \frac{0,08}{12}\right)}(0,009579) = -n$ <p>OR</p> $\frac{\log(0,009579)}{\log\left(1 + \frac{0,08}{12}\right)} = -n$ $n = 699,548824061$ <p>∴ He will survive 702 months after his retirement on his current lifestyle.</p>	<p>✓ substitution in correct formula</p> <p>✓ answer</p> <p>✓ substitution in correct formula</p> <p>✓ simplification</p> <p>✓ correct use of logs</p> <p>✓ $n = 699,55$</p> <p>✓ answer</p> <p style="text-align: right;">(7)</p>
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6.3	$A = P(1 + i)^n$ $= 3\,000\,000 \left(1 + \frac{0,08}{12}\right)^{702}$ $= 318\,327\,675,10$ <p>OR</p> $= 3\,060\,400,889 \left(1 + \frac{0,08}{12}\right)^{699}$ $= 318\,327\,675,10$ $F = \frac{x \left[(1 + i)^n - 1 \right]}{i}$ $= \frac{20\,600 \left[\left(1 + \frac{0,08}{12}\right)^{699} - 1 \right]}{\frac{0,08}{12}}$ $= 318\,316\,427,40$ <p>Outstanding amount after month 699</p> $= A - F$ $= 318\,327\,675,10 - 318\,316\,427,40$ $= R11\,247,73$ <p>Last withdrawal:</p> $A = P(1 + i)^n$ $= 11\,247,73 \left(1 + \frac{0,08}{12}\right)^1$ $= R11\,322,72$ <p>OR</p> $P = \frac{x \left[1 - (1 + i)^{-n} \right]}{i}$ $= \frac{20\,600 \left[1 - \left(1 + \frac{0,08}{12}\right)^{-0,548824061} \right]}{\frac{0,08}{12}}$ $= R11\,247,73546$ <p>Last withdrawal:</p> $A = P(1 + i)^n$ $= 11\,247,73 \left(1 + \frac{0,08}{12}\right)^1$ $= R11\,322,72$	<p>✓ substitution in correct formula</p> <p>✓ substitution in correct formula</p> <p>✓ A - F</p> <p>✓ answer (4)</p> <p>OR</p> <p>✓ $n = -0,548824061$</p> <p>✓ substitution in correct formula</p> <p>✓ answer</p> <p>✓ answer (4)</p> <p>[15]</p>
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QUESTION 7

<p>7.1</p>	$f(x) = -x^2 + 7x + 9$ $f(x + h) = -(x + h)^2 + 7(x + h) + 9$ $= -(x^2 + 2xh + h^2) + 7x + 7h + 9$ $= -x^2 - 2xh - h^2 + 7x + 7h + 9$ $f(x + h) - f(x) = (-x^2 - 2xh - h^2 + 7x + 7h + 9) - (-x^2 + 7x + 9)$ $= -2xh - h^2 + 7h$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x + h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-2xh - h^2 + 7h}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-2x - h + 7)}{h}$ $= \lim_{h \rightarrow 0} (-2x - h + 7)$ $= -2x + 7$ <p>OR</p> $f(x) = -x^2 + 7x + 9$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x + h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-(x + h)^2 + 7(x + h) + 9 - (-x^2 + 7x + 9)}{h}$ $= \lim_{h \rightarrow 0} \frac{-(x^2 + 2xh + h^2) + 7x + 7h + 9 + x^2 - 7x - 9}{h}$ $= \lim_{h \rightarrow 0} \frac{-x^2 - 2xh - h^2 + 7x + 7h + 9 + x^2 - 7x - 9}{h}$ $= \lim_{h \rightarrow 0} \frac{-2xh - h^2 + 7h}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-2x - h + 7)}{h}$ $= \lim_{h \rightarrow 0} (-2x - h + 7)$ $= -2x + 7$	<p>✓ $-(x + h)^2 + 7(x + h) + 9$</p> <p>✓ simplification</p> <p>✓ substitution in formula</p> <p>✓ factors</p> <p>✓ answer (5)</p> <p>OR</p> <p>✓ $-(x + h)^2 + 7(x + h) + 9$</p> <p>✓ substitution in formula</p> <p>✓ simplification</p> <p>✓ factors</p> <p>✓ answer (5)</p>
<p>7.2</p>	$f(x) = \frac{4}{x^2} + 3x^5$ $= 4x^{-2} + 3x^5$ $f'(x) = -8x^{-3} + 15x^4$	<p>✓ $4x^{-2}$</p> <p>✓ $-8x^{-3}$ ✓ $+15x^4$</p> <p>(3)</p>



7.3	$\frac{y}{x-3} = 1 + x$ $y = (x-3)(1+x)$ $= x + x^2 - 3 - 3x$ $= x^2 - 2x - 3$ $\frac{dy}{dx} = 2x - 2$	✓ y subject ✓ simplification ✓ answer	(3) [11]
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QUESTION 8

8.1	$y = a(x-x_1)(x-x_2)(x-x_3)$ $= a(x-3)^2(x+2)$ $9 = a(0-3)^2(0+2)$ $9 = a(9)(2)$ $a = \frac{1}{2}$ $g(x) = \frac{1}{2}(x-3)^2(x+2)$ $= \frac{1}{2}(x^2 - 6x + 9)(x+2)$ $= \frac{1}{2}(x^3 - 6x^2 + 9x + 2x^2 - 12x + 18)$ $= \frac{1}{2}(x^3 - 4x^2 - 3x + 18)$ $= \frac{1}{2}x^3 - 2x^2 - \frac{3}{2}x + 9$ $a = \frac{1}{2} \quad b = -2 \quad c = -\frac{3}{2} \quad d = 9$	✓ substitution roots ✓ substitution (0; 9) ✓ $a = \frac{1}{2}$ ✓ simplification	(4)
8.2	$g'(x) = \frac{3}{2}x^2 - 4x - \frac{3}{2}$ $0 = \frac{3}{2}x^2 - 4x - \frac{3}{2}$ $0 = 3x^2 - 8x - 3$ $x = \frac{8 \pm \sqrt{(-8)^2 - 4(3)(-3)}}{2(3)} \quad \text{or} \quad 0 = (x-3)(3x+1)$ $x = 3 \quad \text{or} \quad x = -\frac{1}{3}$ <p><i>n.a.</i></p>	✓ $g'(x) = \frac{3}{2}x^2 - 4x - \frac{3}{2}$ ✓ $g'(x) = 0$ ✓ formula/factors ✓ $x = -\frac{1}{3}$	(4)

8.3	$g''(x) = 3x - 4$ $0 = 3x - 4$ $4 = 3x$ $\frac{4}{3} = x$ $\therefore \text{concave up: } x > \frac{4}{3}$	✓ $g''(x) = 3x - 4$ ✓ $g''(x) = 0$ ✓ answer (3)
8.4	$\frac{3}{2}x^2 - 4x - \frac{3}{2} = -\frac{7}{2}$ $3x^2 - 8x - 3 = -7$ $3x^2 - 8x + 4 = 0$ $(x - 2)(3x - 2) = 0$ $x = 2 \quad \text{or} \quad x = \frac{2}{3}$ $y = 2 \quad \quad \quad n.a.$	✓ $g'(x) = -\frac{7}{2}$ ✓ standard form ✓ factors/formula ✓ $x = 2$ ✓ $y = 2$ (5) [16]

QUESTION 9

9.1	$4r + 2h = 16$ $2r + h = 8$ $h = 8 - 2r$	✓ equating ✓ simplification (2)
9.2	$V = \pi r^2 h$ $= \pi r^2 (8 - 2r)$ $= 8\pi r^2 - 2\pi r^3$	✓ formula ✓ substitution ✓ answer (3)
9.3	$V'(r) = 16\pi r - 6\pi r^2$ $0 = 16\pi r - 6\pi r^2$ $0 = 8\pi r - 3\pi r^2$ $0 = r(8\pi - 3\pi r)$ $r = 0 \quad \text{or} \quad 8\pi - 3\pi r = 0$ $n.a. \quad \quad \quad 8\pi = 3\pi r$ $r = \frac{8}{3}$ $h = 8 - 2\left(\frac{8}{3}\right)$ $= \frac{8}{3}$	✓ $V'(r) = 16\pi r - 6\pi r^2$ ✓ $V'(r) = 0$ ✓ factors ✓ $r = \frac{8}{3}$ ✓ $h = \frac{8}{3}$ (5) [10]

QUESTION 10

10.1	$P(\text{Tom and Jerry}) = 0,85 \times 0,67$ $= 0,5695$ $\approx 0,57$	✓ $0,85 \times 0,67$ ✓ answer (2)
10.2	$P(\text{Tom and not Jerry}) = 0,85 \times 0,33$ $= 0,2805$ $\approx 0,28$	✓ $0,85 \times 0,33$ ✓ answer (2)
10.3	$P(\text{At least one})$ $= 1 - P(\text{none})$ $= 1 - P(\text{not Tom and not Jerry})$ $= 1 - (0,15)(0,33)$ $= 1 - 0,0495$ $= 0,9505$ $\approx 0,95$ <p>OR</p> $P(\text{At least one})$ $= P(\text{Tom and not Jerry}) \text{ or } P(\text{Jerry and not Tom})$ $\text{ or } P(\text{Tom and Jerry})$ $= (0,85 \times 0,33) + (0,67 \times 0,15) + (0,85 \times 0,67)$ $= 0,2805 + 0,1005 + 0,5695$ $= 0,9505$ $\approx 0,95$	✓ $1 - P(\text{none})$ ✓ $P(\text{none})$ ✓ answer (3) <p>OR</p> ✓ $(0,85 \times 0,33) +$ $(0,67 \times 0,15)$ ✓ $(0,85 \times 0,67)$ ✓ answer (3) [7]

QUESTION 11

11.1	<p>Number of 5-digit numbers in the bottle</p> $= (1 \times 10 \times 10 \times 10 \times 10) - 1$ $= 10\,000 - 1$ $= 9\,999$	<p>✓ 10 000 ✓ 9 999</p> <p>(2)</p>
11.2	<p>Number of 5-digit numbers that does not repeat:</p> $= 1 \times 9 \times 8 \times 7 \times 6$ $= 3\,024$ <p>Number of 5-digit numbers that does not repeat without a 6:</p> $= 1 \times 8 \times 7 \times 6 \times 5$ $= 1\,680$ <p>Number of 5-digit numbers with at least one 6:</p> $= 3\,024 - 1\,680$ $= 1\,344$ <p>$P(5\text{-digit number with at least one } 6)$</p> $= \frac{1\,344}{9\,999}$ $= 0,13$	<p>✓ 3 024</p> <p>✓ 1 680</p> <p>✓ 1 344</p> <p>✓ 0,13</p> <p>(4) [6]</p>
TOTAL:		150



COGNITIVE LEVELS

MATHEMATICS P1

QUESTION	COGNITIVE LEVELS				TOPICS						
	LEVEL 1 (20%)	LEVEL 2 (35%)	LEVEL 3 (30%)	LEVEL 4 (15%)	ALGEBRA	PATTERNS	FUNCTIONS	FINANCE	DIFFERENTIATION	PROBABILITY	TOTAL MARKS
1.1.1	3				3						
1.1.2		3			3						
1.1.3		6			6						
1.2.1	1				1						
1.2.2	1				1						
1.3		6			6						
1.4			3		3						23
2.1.1	3					3					
2.1.2		2				2					
2.1.3			4			4					
2.2				4		4					
3.1.1	3					3					13
3.1.2	2					2					
3.2.1			3			3					
3.2.2			3			3					
3.3				4		4					15
4.1	3						3				
4.2	1						1				
4.3	3						3				
4.4	2						2				
4.5	2						2				
4.6		5					5				
4.7		3					3				
4.8			2				2				21
5.1		2					2				
5.2		2					2				
5.3		2					2				
5.4	2						2				
5.5				2			2				
5.6			3					3			13
6.1		4					4				
6.2			7				7				
6.3				4			4				15
7.1		5						5			
7.2	3							3			
7.3			3					3			11
8.1		4						4			
8.2		4						4			
8.3		3						3			
8.4			5					5			16

NSC – Marking guidelines

QUESTION	COGNITIVE LEVELS				TOPICS						TOTAL MARKS
	LEVEL 1 (25%)	LEVEL 2 (30 %)	LEVEL 3 (30%)	LEVEL 4 (15%)							
	KNOWLEDGE	ROUTINE PROCEDURES	COMPLEX PROCEDURES	PROBLEM SOLVING	ALGEBRA	PATTERNS	FUNCTIONS	FINANCE	DIFFERENTIATION	PROBABILITY	
9.1			2						2		
9.2				3					3		
9.3				5					5		10
10.1	2									2	
10.2		2								2	
10.3			3							3	7
11.1			2							2	
11.2			4							4	6
TOT	31	53	44	22	23	28	34	15	37	13	150
%	21%	35%	29%	15%							
PoI	20%	35%	30%	15%	25	25	35	15	35	15	150

