



education

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NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICS P1
SEPTEMBER 2021
MARKING GUIDELINES

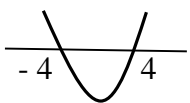
MARKS: 150

These marking guidelines consists of 16 pages and 2 pages with the cognitive grid.

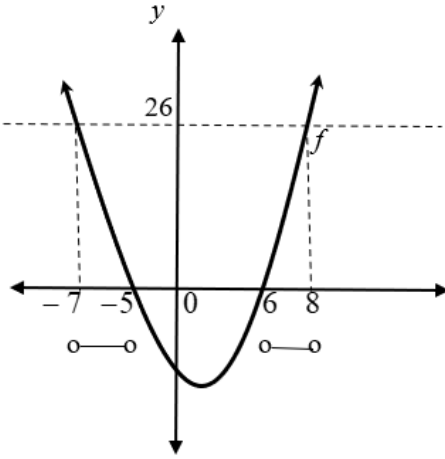
NOTE:

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

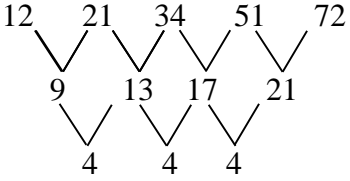
QUESTION 1

| | | |
|-------|--|---|
| 1.1.1 | $(2x - 1)(x + 5) = 0$ $2x - 1 = 0$ or $x + 5 = 0$ $2x = 1$ $x = -5$ $x = \frac{1}{2}$ | $\checkmark x = -5$ $\checkmark x = \frac{1}{2}$ (2) |
| 1.1.2 | $7x^2 + 5x - 9 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-5 \pm \sqrt{5^2 - 4(7)(-9)}}{2(7)}$ $= \frac{-5 \pm \sqrt{277}}{14}$ $x = 0,83$ or $x = -1,55$ | \checkmark substitution into the correct formula $\checkmark x = 0,83$ $\checkmark x = -1,55$ (3) |
| 1.1.3 | $x^2 - 16 \geq 0$ $(x + 4)(x - 4) \geq 0$ $\therefore x \leq -4$ or $x \geq 4$ OR $x \in (-\infty ; -4] \cup [4 ; \infty)$ |  \checkmark factors/critical values $\checkmark x \leq -4$ $\checkmark x \geq 4$ (3) |
| 1.1.4 | $3^{2x} + 2 \cdot 3^x = 3$ $3^{2x} + 2 \cdot 3^x - 3 = 0$ Let $k = 3^x$ $k^2 + 2k - 3 = 0$ $(k - 1)(k + 3) = 0$ $k = 1$ or $k = -3$ $3^x = 1$ $3^x = -3$ $3^x = 3^0$ n.a. $x = 0$ OR | \checkmark standard form \checkmark factors/formula \checkmark both equations $\checkmark 1 = 3^0$ \checkmark answer (5) |

| | | |
|-----|---|---|
| | $3^{2x} + 2 \cdot 3^x = 3$ $3^{2x} + 2 \cdot 3^x - 3 = 0$ $(3^x - 1)(3^x + 3) = 0$ $3^x = 1 \quad \text{or} \quad 3^x = -3$ $3^x = 1 \quad \quad \quad 3^x = -3$ $3^x = 3^0 \quad \quad \quad \text{n.a.}$ $x = 0$ | ✓ standard form ✓ factors/formula ✓ both equations ✓ $1 = 3^0$ ✓ answer (5) |
| 1.2 | $x - 2y = 1$ $x = 2y + 1$ $4x^2 - 3xy = 5 + 4y$ $4(2y + 1)^2 - 3(2y + 1)y = 5 + 4y$ $4(4y^2 + 4y + 1) - 6y^2 - 3y - 5 - 4y = 0$ $16y^2 + 16y + 4 - 6y^2 - 3y - 5 - 4y = 0$ $10y^2 + 9y - 1 = 0$ $(10y - 1)(y + 1) = 0$ $y = \frac{1}{10} \quad \text{or} \quad y = -1$ $x = 2\left(\frac{1}{10}\right) + 1 \quad \text{or} \quad x = 2(-1) + 1$ $\quad = \frac{6}{5} \quad \quad \quad = -1$ OR | ✓ $x = 2y + 1$ ✓ substitution ✓ standard form ✓ factors/formula ✓ both y-values ✓ both x-values (6) |

| | | |
|-------|---|--|
| | $x - 2y = 1$ $2y = x - 1$ $y = \frac{x - 1}{2}$ $4x^2 - 3xy = 5 + 4y$ $4x^2 - 3x\left(\frac{x - 1}{2}\right) = 5 + 4\left(\frac{x - 1}{2}\right)$ $8x^2 - 3x(x - 1) = 10 + 4(x - 1)$ $8x^2 - 3x^2 + 3x - 10 - 4x + 4 = 0$ $5x^2 - x - 6 = 0$ $(5x - 6)(x + 1) = 0$ $x = \frac{6}{5} \quad \text{or} \quad x = -1$ $y = \frac{\frac{6}{5} - 1}{2} \quad \text{or} \quad y = \frac{-1 - 1}{2}$ $= \frac{1}{10} \quad \quad \quad = -1$ | $\checkmark y = \frac{x - 1}{2}$ \checkmark substitution \checkmark standard form \checkmark factors/formula \checkmark both x -values \checkmark both y -values (6) |
| 1.3.1 | $(x + 5)(x - 6) = 26$ $x^2 - x - 30 = 26$ $x^2 - x - 56 = 0$ $(x - 8)(x + 7) = 0$ $x = 8 \quad \text{of} \quad x = -7$ | \checkmark standard form \checkmark both answers (2) |
| 1.3.2 | $f(x) = 26$ if $x = -7$ or $x = 8$ $f(x) = 0$ if $x = -5$ or $x = 6$ \therefore If $0 < f(x) < 26$ then $-7 < x < -5$ or $6 < x < 8$  | $f(x) = 0$ if : $\checkmark x = -5$ or $x = 6$ $\checkmark -7 < x < -5$ $\checkmark 6 < x < 8$ (3) [24] |

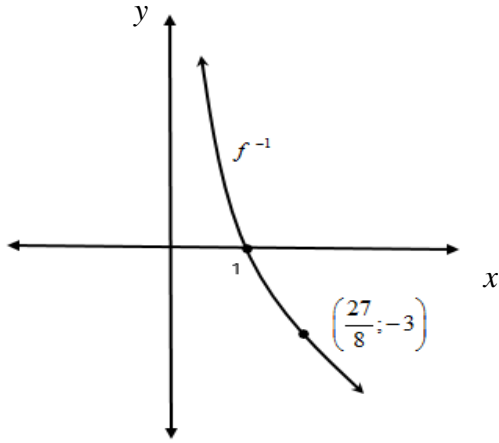
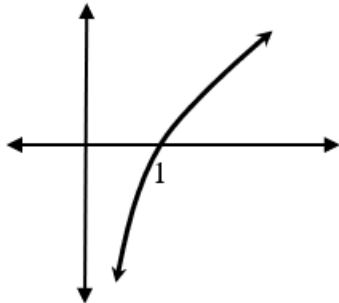
QUESTION 2

| | | |
|-------|--|--|
| 2.1.1 |  <p>The next two terms: 51; 72</p> | <p>✓ 51 ✓ 72</p> <p>(2)</p> |
| 2.1.2 | $2a = 4$ $a = 2$ $T_2 - T_1 = 3a + b$ $9 = 3(2) + b$ $9 = 6 + b$ $b = 3$ $T_1 = a + b + c$ $12 = 2 + 3 + c$ $c = 7$ $\therefore T_n = 2n^2 + 3n + 7$ | <p>✓ 2nd difference = 4</p> <p>✓ $a = 2$</p> <p>✓ $b = 3$</p> <p>✓ $c = 7$</p> <p>(4)</p> |
| 2.1.3 | $T_n = 2n^2 + 3n + 7$ $T_{60} = 2(60)^2 + 3(60) + 7$ $= 7\,387$ | <p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p> |
| 2.2.1 | $4 + 7 + 10 + \dots + 172$ $T_n = a + (n - 1)d$ $172 = 4 + (n - 1)(3)$ $168 = (n - 1)(3)$ $56 = n - 1$ $n = 57$ | <p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p> |
| 2.2.2 | $S_n = \frac{n}{2}[2a + (n - 1)d]$ $S_{57} = \frac{57}{2}[2(4) + (57 - 1)(3)]$ $= 5016$ <p>OR</p> $S_n = \frac{n}{2}[a + l]$ $S_{57} = \frac{57}{2}[4 + 172]$ $= 5016$ | <p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p> <p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p> <p>[12]</p> |

QUESTION 3

| | | |
|-------|--|--|
| 3.1.1 | $\sum_{k=3}^{12} 4\left(\frac{1}{2}\right)^{k-1}$ $= 4\left(\frac{1}{2}\right)^2 + 4\left(\frac{1}{2}\right)^3 + 4\left(\frac{1}{2}\right)^4 + \dots$ $= 1 + \frac{1}{2} + \frac{1}{4} + \dots$ <div style="border: 1px solid black; padding: 2px; display: inline-block;">Answer only: Full marks</div> | ✓ substitution ✓ answer (2) |
| 3.1.2 | $1 + \frac{1}{2} + \frac{1}{4} + \dots$ $S_n = \frac{a(1 - r^n)}{1 - r}$ $S_{10} = \frac{1\left(1 - \left(\frac{1}{2}\right)^{10}\right)}{1 - \frac{1}{2}}$ $= \frac{1\,023}{512}$ | ✓ $n = 10$ ✓ substitution ✓ answer (3) |
| 3.2.1 | $\cos \theta + \sin 2\theta + 4\sin^2 \theta \cos \theta + \dots$ $= \cos \theta + 2\sin \theta \cos \theta + 4\sin^2 \theta \cos \theta$ $\frac{T_2}{T_1} = \frac{2\sin \theta \cos \theta}{\cos \theta} = 2\sin \theta$ $\frac{T_3}{T_2} = \frac{4\sin^2 \theta \cos \theta}{2\sin \theta \cos \theta} = 2\sin \theta$ $\therefore \frac{T_2}{T_1} = \frac{T_3}{T_2}$ $\therefore \text{Geometric series}$ | ✓ $2\sin \theta \cos \theta$ ✓ $\frac{T_2}{T_1} = 2\sin \theta$ ✓ $\frac{T_3}{T_2} = 2\sin \theta$ ✓ $\frac{T_2}{T_1} = \frac{T_3}{T_2}$ (4) |
| 3.2.2 | $-1 < r < 1$ $-1 < 2\sin \theta < 1$ $-\frac{1}{2} < \sin \theta < \frac{1}{2}$ $0^\circ < \theta < 30^\circ$ | ✓ substitution ✓ simplify ✓ answer (3) [12] |

QUESTION 4

| | | |
|-----|--|---|
| 4.1 | $f(x) = p^x$ $\frac{27}{8} = p^{-3}$ $\frac{8}{27} = p^3$ $\frac{2}{3} = p$ | ✓ substitution ✓ simplify (2) |
| 4.2 | $f: y = \left(\frac{2}{3}\right)^x$ $f^{-1}: x = \left(\frac{2}{3}\right)^y$ $y = \log_{\frac{2}{3}} x$ | ✓ swop x and y ✓ answer (2) |
| 4.3 |  | ✓ shape ✓ (1; 0) ✓ $\left(\frac{27}{8}; -3\right)$ (3) |
| 4.4 | $k(x) = \left(\frac{2}{3}\right)^{-x}$ $= \left(\frac{3}{2}\right)^x$ <div style="border: 1px solid black; padding: 2px; display: inline-block;">Answer only: Full marks</div> | ✓ $\left(\frac{2}{3}\right)^{-x}$ ✓ $\left(\frac{3}{2}\right)^x$ (2) |
| 4.5 |  $0 < x \leq 1$ OR $x \in (0; 1]$ OR $\log_{\frac{3}{2}} x \leq 0$ when $\log_{\frac{2}{3}} x \geq 0$ $0 < x \leq 1$ OR $x \in (0; 1]$ | ✓ increasing graph ✓ $0 < x$ ✓ $x \leq 1$ (3) ✓ relating $\log_{\frac{3}{2}} x$ to $\log_{\frac{2}{3}} x$ ✓ $0 < x$ ✓ $x \leq 1$ (3) [12] |

QUESTION 5

| | | |
|-----|---|---|
| 5.1 | $y = -10$ $(0 ; -10)$ | ✓ $y = -10$ (1) |
| 5.2 | Axis of symmetry : $x = 3$ $\therefore x$ -intercepts : $x = 5$ or $x = 1$ $\therefore D(1 ; 0)$ <div>Answer only: Full marks</div> | ✓ axis of symmetry : $x = 3$ ✓ $D(1 ; 0)$ (2) |
| 5.3 | $y = a(x - 5)(x - 1)$ $-10 = a(0 - 5)(0 - 1)$ $-10 = a(5)$ $a = -2$ $f(x) = -2(x - 5)(x - 1)$ $= -2(x^2 - 6x + 5)$ $= -2x^2 + 12x - 10$ OR $f(x) = a(x - 3)^2 + k$ $0 = a(5 - 3)^2 + k$ $0 = 4a + k \dots\dots\dots(1)$ $-10 = a(0 - 3)^2 + k$ $-10 = 9a + k \dots\dots(2)$ $0 = 4a + k \dots\dots\dots(1)$ $-10 = 5a$ $a = -2$ $0 = 4(-2) + k$ $k = 8$ $f(x) = -2(x - 3)^2 + 8$ $= -2(x^2 - 6x + 9) + 8$ $= -2x^2 + 12x - 18 + 8$ $= -2x^2 + 12x - 10$ | ✓ substitution ✓ substitution $(0 ; -10)$ ✓ $-10 = 5a$ ✓ simplify (4) ✓ substitution $E(3; k)$ ✓ substitution $(0 ; -10)$ and $(5 ; 0)$ ✓ $-10 = 5a$ ✓ simplify (4) |
| 5.4 | $f(x) = -2x^2 + 12x - 10$ $f(3) = -2(3)^2 + 12(3) - 10$ $= 8$ $\therefore E(3;8)$ <div>Answer only: Full marks</div> | ✓ substitution ✓ answer (2) |

| | | |
|------|---|--|
| 5.5 | $g(x) = \frac{m}{x-5} - 10$ $8 = \frac{m}{3-5} - 10$ $18 = \frac{m}{-2}$ $m = -36$ $\therefore g(x) = \frac{-36}{x-5} - 10$ | ✓ substitution of p and q ✓ substitution (3; 8) ✓ $m = -36$ (3) |
| 5.6 | $y = \frac{-36}{0-5} - 10$ $= -2,8$ $\therefore (0; -2,8)$ | ✓ $x = 0$ ✓ $y = -2,8$ (2) |
| 5.7 | $h(x) = -(x-5) - 10$ $= -x - 5$ <p>OR</p> $y = -x + c$ $-10 = -5 + c$ $c = -5$ $\therefore h(x) = -x - 5$ | ✓ $m = -1$ ✓ answer (2) ✓ $m = -1$ ✓ answer (2) |
| 5.8 | $0 = \frac{-36}{x-5} - 10$ $10 = \frac{-36}{x-5}$ $10(x-5) = -36$ $10x - 50 = -36$ $10x = 14$ $x = \frac{14}{10} = \frac{7}{5} = 1,4$ | ✓ $g(x) = 0$ ✓ simplify ✓ answer (3) |
| 5.9 | $x \in [1 ; 1,4]$ | ✓ critical values ✓ notation (2) |
| 5.10 | $g(x) = -t$ $-2,8 > -t > -10$ $2,8 < t < 10$ <p>OR $t \in (2,8 ; 10)$</p> | ✓ critical values ✓ notation (2) [23] |

| | | |
|-------|--|---|
| 6.2.1 | $1 + i_{eff} = \left(1 + \frac{i_{nom}}{m}\right)^m$ $= \left(1 + \frac{0,08}{12}\right)^{12}$ $= 1,082999507$ $1,082999507 = \left(1 + \frac{i_{halve}}{2}\right)^2$ $\sqrt{1,082999507} = 1 + \frac{i_{halve}}{2}$ $1,0406726223 = 1 + \frac{i_{halve}}{2}$ $0,0406726223 = \frac{i_{halve}}{2}$ $0,0813452446 = i_{halve}$ $i_{halve} \approx 0,0813$ $r = 8,13\%$ | <p>✓ substitution</p> <p>✓ substitution</p> <p>✓ simplify</p> <p>✓ $r = 8,13\%$ or $i = 0.0613$</p> <p>(4)</p> |
| 6.2.2 | $P = \frac{x[1 - (1 + i)^{-n}]}{i}$ $808\,350,41 - 95\,000 = \frac{95\,000 \left[1 - \left(1 + \frac{0,0813}{2}\right)^{-n}\right]}{\frac{0,0813}{2}}$ $0,305238886 = 1 - \left(1 + \frac{0,0813}{2}\right)^{-n}$ $\left(1 + \frac{0,0813}{2}\right)^{-n} = 0,694761114$ $-n = \log_{\left(1 + \frac{0,0813}{2}\right)}(0,694761114)$ <p>OR</p> $-n = \frac{\log(0,694761114)}{\log\left(1 + \frac{0,0813}{2}\right)}$ $n = 9.14$ <p>∴ he will be able to study 10 (9 plus the first payment) complete semesters</p> | <p>✓ i</p> <p>✓ substitution into the correct formula</p> <p>✓ simplify</p> <p>✓ logs</p> <p>✓ answer</p> <p>(5) [13]</p> |

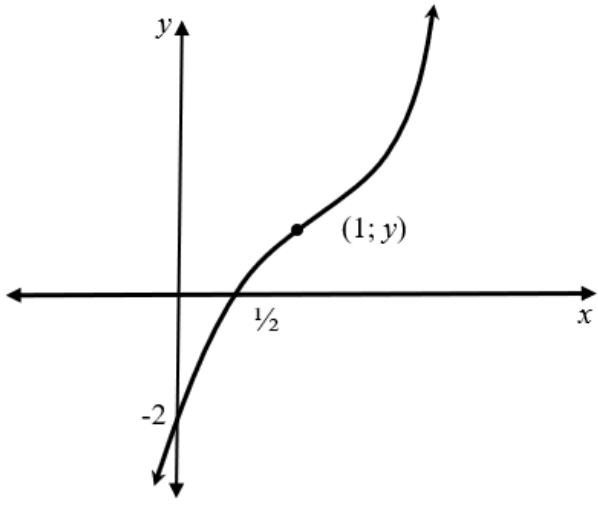
QUESTION 7

| | | |
|-----|--|---|
| 7.1 | $f(x) = 3x^2 + 11$ $f(x+h) = 3(x+h)^2 + 11$ $= 3(x^2 + 2xh + h^2) + 11$ $= 3x^2 + 6xh + 3h^2 + 11$ $f(x+h) - f(x) = (3x^2 + 6xh + 3h^2 + 11) - (3x^2 + 11)$ $= 6xh + 3h^2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{6xh + 3h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(6x + 3h)}{h}$ $= \lim_{h \rightarrow 0} (6x + 3h)$ $= 6x$ <p>OR</p> $f(x) = 3x^2 + 11$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{[3(x+h)^2 + 11] - (3x^2 + 11)}{h}$ $= \lim_{h \rightarrow 0} \frac{3(x^2 + 2xh + h^2) + 11 - 3x^2 - 11}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{3x^2 + 6xh + 3h^2 + 11 - 3x^2 - 11}{h}$ $= \lim_{h \rightarrow 0} \frac{6xh + 3h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(6x + 3h)}{h}$ $= \lim_{h \rightarrow 0} (6x + 3h)$ $= 6x$ | <p>✓ $3(x+h)^2 + 11$</p> <p>✓ simplify</p> <p>✓ substitution into formula</p> <p>✓ factors</p> <p>✓ answer</p> <p>(5)</p> |
| 7.2 | $f(x) = \frac{2x^4 - \pi x^{\frac{1}{2}} + 8}{x^{\frac{1}{2}}}$ $= 2x^{\frac{7}{2}} - \pi + 8x^{-\frac{1}{2}}$ $\frac{dy}{dx} = 7x^{\frac{5}{2}} - 4x^{-\frac{3}{2}}$ | <p>✓ $\sqrt{x} = x^{\frac{1}{2}}$</p> <p>✓ simplify</p> <p>✓ $7x^{\frac{5}{2}}$ ✓ $-4x^{-\frac{3}{2}}$</p> <p>(4)</p> <p>[9]</p> |

QUESTION 8

| | | |
|-------|---|--|
| 8.1 | $f(x) = ax^3 + bx + c$ $f'(x) = 3ax^2 + b$ $0 = 3a(2)^2 + b$ $0 = 12a + b \dots\dots\dots(1)$ $15 = 3a(3)^2 + b$ $15 = 27a + b \dots\dots\dots(2)$ $0 = 12a + b \dots\dots\dots(1)$ $15 = 15a$ $a = 1$ $0 = 12(1) + b$ $b = -12$ $32 = 1(-2)^3 - 12(-2) + c$ $32 = -8 + 24 + c$ $c = 16$ | ✓ $f'(x) = 3ax^2 + b$ ✓ substitution ✓ substitution ✓ elimination/substitution ✓ substitution ✓ substitution (6) |
| 8.2.1 | $f'(x) = 3x^2 - 12$ $f''(x) = 6x$ $0 = 6x$ $x = 0$ | ✓ $f''(x) = 6x$ ✓ $x = 0$ (2) |
| 8.2.2 | $x < 0$ | ✓ answer (1) |
| 8.3 | $D'(-2; -32)$ | ✓ $x = -2$ ✓ $y = -32$ (2) |
| 8.4 | Yes, because f satisfies the vertical line test. | ✓ yes ✓ reason (2) [13] |

QUESTION 9

| | | |
|-----|---|--|
| 9.1 | $x \in \mathbb{R}$ OR $x \in (-\infty; \infty)$ | ✓ answer (1) |
| 9.2 | $m = 2$ | ✓ answer (1) |
| 9.3 |  | ✓ shape ✓ point of inflection at $x = 1$ ✓ x-intercept ✓ y-intercept (4) [6] |

QUESTION 10

| | | |
|------|--|--|
| 10.1 | $S(t) = t - \frac{t^2}{6}$ $S(1) = 1 - \frac{1^2}{6}$ $= \frac{5}{6}$ $= 0,83 \text{ km from A.}$ | ✓ substitution ✓ answer (2) |
| 10.2 | Speed : $S'(t) = 1 - \frac{2}{6}t \quad \text{or} \quad t = \frac{-1}{2\left(-\frac{1}{6}\right)}$ $0 = 1 - \frac{1}{3}t$ $\frac{1}{3}t = 1$ $t = 3 \text{ min}$ Distance: $S(3) = 3 - \frac{3^2}{6}$ $= 1.5 \text{ km}$ $\therefore \text{Bus doesn't reach the top.}$ <p>OR</p> | ✓ $0 = 1 - \frac{2}{6}t$ ✓ $t = 3$ ✓ $S(3) = 1.5$ ✓ conclusion (4) |

| | | |
|------|---|---|
| | $2 = t - \frac{t^2}{6}$ $t^2 - 6t + 12 = 0$ $t = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(12)}}{2(1)}$ <p>roots are non-real \therefore the bus will not reach the top of the hill</p> | <p>✓ equating distance to 2km</p> <p>✓ standard form</p> <p>✓ substitution</p> <p>✓ conclusion</p> <p>(4)</p> |
| 10.3 | $S'(t) = 1 - \frac{1}{3}t$ $S'(1) = 1 - \frac{1}{3}(1)$ $= \frac{2}{3}$ $= 0,67 \text{ km/min}$ | <p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p> |
| 10.4 | $S'(t) = 1 - \frac{1}{3}t$ $S''(t) = -\frac{1}{3} \text{ km/min}^2$ | <p>✓ answer</p> <p>(1)</p> <p>[9]</p> |

QUESTION 11

| | | |
|------|---|--|
| 11.1 | $P(\text{Green}) = \frac{66}{126}$ $= 0,52$ | <p>✓ $\frac{66}{126}$</p> <p>✓ $\frac{66}{126}$</p> <p>(2)</p> |
| 11.2 | $\text{LH} = P(\text{boy}) \times P(\text{blue})$ $= \frac{50}{126} \times \frac{60}{126}$ $= \frac{250}{1\,323}$ $= 0,19$ $\text{RH} = P(\text{boy and blue})$ $= \frac{19}{126}$ $= 0,15$ <p>$\therefore P(\text{boy}) \times P(\text{blue}) \neq P(\text{boy and blue})$ \therefore The events are not independent.</p> | <p>✓ $\frac{50}{126} \times \frac{60}{126} = 0,19$</p> <p>✓ $\frac{19}{126} = 0,15$</p> <p>✓ $P(\text{boy}) \times P(\text{blue}) \neq P(\text{boy and blue})$</p> <p>✓ conclusion</p> <p>(4)</p> <p>[6]</p> |

QUESTION 12

| | | |
|------|--|--|
| 12.1 | Fastest to slowest in lane 1 tot 12 $= 1$ | ✓ answer (1) |
| 12.2 | $12! - (2!)(11!)$ $= 399\,168\,000$ | ✓ $12!$ ✓ $(2!)(11!)$ ✓ answer (3) |
| 12.3 | C A B A B A B A B A B C or C B A B A B A B A B A C $[(2)(5!)(5!)(1)] \times 2$ $= 57\,600$ | ✓ $(5!)(5!)$ for A and B ✓ 2 (2 ways for C) ✓ 2 (AB or BA) (3) |
| 12.4 | $\frac{(2 \times 10 \times 9 \times 8 \times 7 \times 6)(6)}{(12)(11)(10)(9)(8)(7)}$ $= \frac{362\,880}{665\,280} = \frac{6}{11}$ | ✓ $(2 \times 11 \times 10 \times 9 \times 8 \times 7)$ ✓ $\times 6$ (or 6 terms) ✓ $(12)(11)(10)(9)(8)(7)$ ✓ answer (4) [11] |
| | TOTAL: 150 | |

COGNITIVE LEVELS

MATHEMATICS P1

| | COGNITIVE LEVELS | | | | TOPICS | | | | | | |
|----------|------------------|-----------------------|-----------------------|--------------------|---------|----------|-----------|---------|----------|-------------|-------------|
| | LEVEL 1 (20%) | LEVEL 2 (35%) | LEVEL 3 (30%) | LEVEL 4 (15%) | | | | | | | |
| QUESTION | KNOWLEDGE | ROUTINE PROCEDURES | COMPLEX PROCEDURES | PROBLEM SOLVING | ALGEBRA | PATTERNS | FUNCTIONS | FINANCE | CALCULUS | PROBABILITY | TOTAL MARKS |
| 1.1.1 | 2 | | | | 2 | | | | | | |
| 1.1.2 | 3 | | | | 3 | | | | | | |
| 1.1.3 | | 3 | | | 3 | | | | | | |
| 1.1.4 | | | 5 | | 5 | | | | | | |
| 1.2 | | 6 | | | 6 | | | | | | |
| 1.3.1 | | 2 | | | 2 | | | | | | |
| 1.3.2 | | | | 3 | 3 | | | | | | 24 |
| 2.1.1 | 2 | | | | | 2 | | | | | |
| 2.1.2 | | 4 | | | | 4 | | | | | |
| 2.1.3 | 2 | | | | | 2 | | | | | |
| 2.2.1 | | 2 | | | | 2 | | | | | |
| 2.2.2 | 2 | | | | | 2 | | | | | 12 |
| 3.1.1 | | 2 | | | | 2 | | | | | |
| 3.1.2 | | 3 | | | | 3 | | | | | |
| 3.2.1 | | | 4 | | | 4 | | | | | |
| 3.2.2 | | | | 3 | | 3 | | | | | 12 |
| 4.1 | | 2 | | | | | 2 | | | | |
| 4.2 | 2 | | | | | | 2 | | | | |
| 4.3 | | 3 | | | | | 3 | | | | |
| 4.4 | | 2 | | | | | 2 | | | | |
| 4.5 | | | 3 | | | | 3 | | | | 12 |
| 5.1 | 1 | | | | | | 1 | | | | |
| 5.2 | 2 | | | | | | 2 | | | | |
| 5.3 | | 4 | | | | | 4 | | | | |
| 5.4 | 2 | | | | | | 2 | | | | |
| 5.5 | | 3 | | | | | 3 | | | | |
| 5.6 | | 2 | | | | | 2 | | | | |
| 5.7 | | 2 | | | | | 2 | | | | |
| 5.8 | | 3 | | | | | 3 | | | | |
| 5.9 | | | 2 | | | | 2 | | | | |
| 5.10 | | | | 2 | | | 2 | | | | 23 |
| 6.1 | | | 4 | | | | | 4 | | | |
| 6.2.1 | | | 4 | | | | | 4 | | | |
| 6.2.2 | | | 5 | | | | | 5 | | | 13 |
| 7.1 | | 5 | | | | | | | 5 | | |
| 7.2 | | | 4 | | | | | | 4 | | 9 |
| 8.1 | | | 6 | | | | | | 6 | | |
| 8.2.1 | | 2 | | | | | | | 2 | | |
| 8.2.2 | 1 | | | | | | | | 1 | | |
| 8.3 | 2 | | | | | | | | 2 | | |
| 8.4 | 2 | | | | | | | | 2 | | 13 |

| | 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 | CALCULUS | PROBABILITY | TOTAL MARKS |
| 9.1 | 1 | | | | | | | | 1 | | |
| 9.2 | 1 | | | | | | | | 1 | | |
| 9.3 | | | 4 | | | | | | 4 | | 6 |
| 10.1 | 2 | | | | | | | | 2 | | |
| 10.2 | | | | 4 | | | | | 4 | | |
| 10.3 | | | | 2 | | | | | 2 | | |
| 10.4 | | | | 1 | | | | | 1 | | 9 |
| 11.1 | 2 | | | | | | | | | 2 | |
| 11.2 | | 4 | | | | | | | | 4 | 6 |
| 12.1 | 1 | | | | | | | | | 1 | |
| 12.2 | | | 3 | | | | | | | 3 | |
| 12.3 | | | | 3 | | | | | | 3 | |
| 12.4 | | | | 4 | | | | | | 4 | 11 |
| TOT | 30 | 54 | 44 | 22 | 24 | 24 | 35 | 13 | 37 | 17 | 150 |
| % | 20% | 36% | 29% | 15% | | | | | | | |
| Pol | 20% | 35% | 30% | 15% | 25 | 25 | 35 | 15 | 35 | 15 | 150 |