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MATHEMATICS P1

SEPTEMBER 2025

MARKING GUIDELINES

**NATIONAL
SENIOR CERTIFICATE**

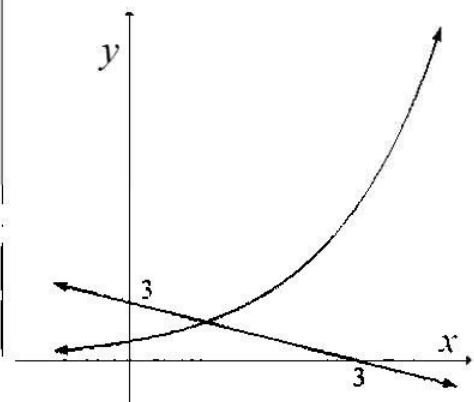
GRADE 12

MARKS: 150

These marking guidelines consist of 16 pages.



QUESTION 1

1.1.1	$x^2 - 11x + 30 = 0$ $(x-6)(x-5) = 0$ $x = 6$ or $x = 5$	✓ A factors ✓ CA answer ✓ CA answer (3)
1.1.2	$3x^2 + 9x + 4 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-(9) \pm \sqrt{(9)^2 - 4(3)(4)}}{2(3)}$ $x = -2,46$ or $x = -0,54$	✓ A substitution ✓ CA answer ✓ CA answer (3)
1.1.3	$\left(\frac{1}{2}\right)^{-x} (3-x) \leq 0$ $\left(\frac{1}{2}\right)^{-x} > 0$ or $(2)^x > 0$ $3-x \leq 0$ $x \geq 3$ OR $x \in [3; \infty)$ OR $\left(\frac{1}{2}\right)^{-x} (x-3) \geq 0$ $\left(\frac{1}{2}\right)^{-x} > 0$ or $(2)^x > 0$ $x-3 \geq 0$ $x \geq 3$ OR $x \in [3; \infty)$ OR  $x \geq 3$ OR $x \in [3; \infty)$	✓ A $\left(\frac{1}{2}\right)^{-x} > 0$ or $(2)^x > 0$ ✓ A $3-x \leq 0$ ✓ A answer (3) OR ✓ A $\left(\frac{1}{2}\right)^{-x} > 0$ or $(2)^x > 0$ ✓ A $x-3 \geq 0$ ✓ A answer (3) OR ✓ A exponential graph drawn ✓ A straight line drawn ✓ A answer (3)



Marking Guideline

1.1.4	$\sqrt{2-7x} + 2x = 0$ $\sqrt{2-7x} = -2x$ $(\sqrt{2-7x})^2 = (-2x)^2$ $4x^2 + 7x - 2 = 0$ $(4x-1)(x+2) = 0$ $x \neq \frac{1}{4} \text{ or } x = -2$	✓ A isolating the surd ✓ CA squaring both sides ✓ CA standard form ✓ CA answers ✓ CA selection (5)
1.2	$\frac{2^{4025} + 2^{4023}}{4^{2011}}$ $= \frac{2^{4022+3} + 2^{4022+1}}{2^{4022}}$ $= \frac{2^3 \cdot 2^{4022} + 2 \cdot 2^{4022}}{2^{4022}}$ $= \frac{2^{4022}(8+2)}{2^{4022}}$ $= 10$ OR $\frac{2^{4025} + 2^{4023}}{4^{2011}}$ $= \frac{2^{4023+2} + 2^{4023}}{2^{4022}}$ $= \frac{2^{4023}(2^2 + 1)}{2^{4022}}$ $= 2(4+1)$ $= 10$	✓ A 2^{4022} ✓ A common factor ✓ CA answer (3)
1.3	$y = 2x - 1$ $(3x - y)(x + y) = 0$ $(3x - (2x - 1))(x + 2x - 1) = 0$ $(x + 1)(3x - 1) = 0$ $x = -1 \text{ or } x = \frac{1}{3}$ $y = 2(-1) - 1 \text{ or } y = 2\left(\frac{1}{3}\right) - 1$ $y = -3 \text{ or } y = -\frac{1}{3}$ OR	✓ A making y subject of the formula ✓ CA substitution ✓ CA simplification ✓ CA x -values ✓ CA y -values (5)



Marking Guideline

	$y = 2x - 1$ $(3x - y)(x + y) = 0$ $3x^2 + 2xy - y^2 = 0$ $3x^2 + 2x(2x - 1) - (2x - 1)^2 = 0$ $3x^2 + 2x - 1 = 0$ $(3x - 1)(x + 1) = 0$ $x = -1$ or $x = \frac{1}{3}$ $y = -3$ or $y = -\frac{1}{3}$ OR $x = \frac{y+1}{2}$ $\left[3\left(\frac{y+1}{2}\right) - y\right]\left[\left(\frac{y+1}{2}\right) + y\right] = 0$ $\left(\frac{1}{2}y + \frac{3}{2}\right)\left(\frac{3}{2}y + \frac{1}{2}\right) = 0$ $y = -3$ or $y = -\frac{1}{3}$ $x = -1$ or $x = \frac{1}{3}$	✓ A making y the subject of the formula ✓ CA substitution ✓ CA standard form ✓ CA x -values ✓ CA y -values (5) OR ✓ A making x subject of the formula ✓ CA substitution ✓ CA simplification ✓ CA x -values ✓ CA y -values (5)
1.4	Let the one integer be x and the other integer y . $(x + y)^2 = x^2 + 2xy + y^2$ $x^2 + y^2 = (x + y)^2 - 2xy$ $= m^2 - 2n$ Answer only: Full marks	✓ A $(x + y)^2 = x^2 + 2xy + y^2$ ✓ A $x^2 + y^2 = (x + y)^2 - 2xy$ ✓ A $x^2 + y^2 = m^2 - 2n$ (3)
		[25]





Marking Guideline

QUESTION 2

2.1.1	$T_2 - T_1 = T_3 - T_2$ $2x+1-(x-3)=4x-1-(2x+1)$ $x+4=2x-2$ $x=6$	$\{$ $\checkmark A \quad 2x+1-(x-3)=4x-1-(2x+1)$ $\checkmark CA \quad \text{simplification}$ $\checkmark CA \quad \text{answer}$ (3)
2.1.2	$3; 13; 23; \dots$ $a=3; d=10$ $T_7 = a+6d$ $= 3+6(10)$ $= 63$ CA: Only for an AS	$\checkmark CA \quad \text{arithmetic sequence}$ $\checkmark CA \quad \text{substitution}$ $\checkmark CA \quad \text{answer}$ (3)
2.2.1	$T_5 = 45$	$\checkmark A \quad \text{answer}$ (1)
2.2.2	$2a=4$ $a=2$ $3a+b=5$ $3(2)+b=5$ $b=-1$ $a+b+c=2$ $2-1+c=2$ $c=1$ $T_n = 2n^2 - n + 1$	$\checkmark A \quad \text{value of } a$ $\checkmark CA \quad \text{value of } b$ $\checkmark CA \quad \text{value of } c$ $\checkmark CA \quad \text{answer}$ (4)
2.2.3	1st differences: $5; 9; 13; \dots$ $a=5; d=4$ $S_n = \frac{n}{2}[2a+(n-1)d]$ $= \frac{n}{2}[2(5)+(n-1)4]$ $= \frac{n}{2}[4n+6]$ $= 2n^2 + 3n$ OR $T_n = 4n+1$ $S_n = \frac{n}{2}[a+l]$ $S_n = \frac{n}{2}[5+4n+1]$ $= \frac{n}{2}[4n+6]$ $= 2n^2 + 3n$	$\checkmark A \quad \text{substitution of } a=5$ $\checkmark A \quad \text{substitution of } d=4$ $\checkmark A \quad \frac{n}{2}[4n+6]$ (3) OR $\checkmark A \quad \text{substitution of } a=5$ $\checkmark A \quad \text{substitution of } l=T_n$ $\checkmark A \quad \frac{n}{2}[4n+6]$ (3)



Marking Guideline

2.2.4	$T_1 + S_{40}$ $= 2 + 3320$ $= T_{41}$ $\therefore 41^{\text{st}} \text{ term}$ OR $T_n = 2n^2 - n + 1 = 3322$ $2n^2 - n - 3321 = 0$ $n = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(2)(-3321)}}{2(2)}$ $n = 41 \text{ or } -40,5$ $\therefore 41^{\text{st}} \text{ term}$ Answer only: Full marks	$\checkmark A \ T_1 + S_{40}$ $\checkmark A \text{ answer}$ OR $\checkmark CA \text{ substitution}$ $\checkmark CA \text{ answer}$ (2)
[16]		

QUESTION 3

3.1	$r = \sqrt{3}$ $T_n = ar^{n-1}$ $\frac{1}{2}(\sqrt{3})^{n-1} = \frac{81\sqrt{3}}{2}$ $(\sqrt{3})^{n-2} = 81$ $\left(3^{\frac{1}{2}}\right)^{n-2} = 3^4$ $\frac{1}{2}n - 1 = 4$ $n = 10$ OR $r = \sqrt{3}$ $T_n = ar^{n-1}$ $\frac{1}{2}(\sqrt{3})^{n-1} = \frac{81\sqrt{3}}{2}$ $(\sqrt{3})^{n-2} = 81$ $n - 2 = \log_{\sqrt{3}} 81$ $n = 10$	$\checkmark A \text{ value of } r$ $\checkmark CA \ \frac{1}{2}(\sqrt{3})^{n-1} = \frac{81\sqrt{3}}{2}$ $\checkmark CA \text{ LHS and RHS as powers of } 3$ $\checkmark CA \text{ answer}$ (4) OR $\checkmark A \text{ value of } r$ $\checkmark CA \ \frac{1}{2}(\sqrt{3})^{n-1} = \frac{81\sqrt{3}}{2}$ $\checkmark CA \text{ correct use of logarithms}$ $\checkmark CA \text{ answer}$ (4)
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Marking Guideline

3.2	$\sum_{k=0}^{\infty} 9p^k = 9 + 9p + 9p^2 + \dots$ $a = 9 ; r = p$ $S_{\infty} = \frac{a}{1-r}$ $S_{\infty} = \frac{9}{1-p}$ $\sum_{m=1}^7 (-27) \left(-\frac{2}{3}\right)^m = (-27) \left(-\frac{2}{3}\right) + (-27) \left(-\frac{2}{3}\right)^2 + \dots + (-27) \left(-\frac{2}{3}\right)^7$ $a = 18 ; r = -\frac{2}{3}$ $S_7 = \frac{-27 \left[\left(-\frac{2}{3}\right)^7 - 1 \right]}{-\frac{2}{3} - 1} = \frac{926}{81}$ $\frac{9}{1-p} = \frac{926}{81}$ $926(1-p) = 729$ $926p = 197$ $p = \frac{197}{926} = 0,21$	✓A expanding ✓CA substitution in S_{∞} formula ✓A $a = 18 ; r = -\frac{2}{3}$ ✓CA substitution in S_n formula ✓CA equating ✓CA answer (6)
[10]		



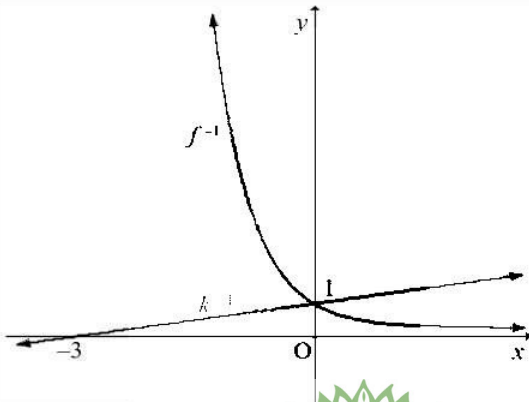
Marking Guideline

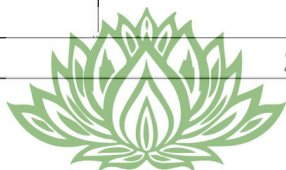
QUESTION 4

4.1	$C(0; 3)$	✓A answer (1)
4.2	$B\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$ $B\left(\frac{0+4}{2}; \frac{3-1}{2}\right)$ $B(2; 1)$	$\checkmark_A \frac{0+4}{2} \checkmark_{CA} \frac{3-1}{2}$ (2)
4.3	$g(x) = \frac{a}{x-2} + 1$ $t = 1$ $r = -2$ Subst. $(0; 3): \frac{a}{0-2} + 1 = 3$ OR subst. $(4; -1): \frac{a}{4-2} + 1 = -1$ $a = -4$	$\checkmark_A$ value of t $\checkmark_A$ value of r $\checkmark_{CA}$ substituting $(0; 3)$ OR $(4; -1)$ $\checkmark_{CA}$ value of a (4)
4.4	$x = -1$ and $y = 0$	$\checkmark_{CA} x = -1$ $\checkmark_{CA} y = 0$ (2)
4.5	$f(x) = \frac{1}{2}(x+2)^2 + w$ Subst. $(2; 1): \frac{1}{2}(2+2)^2 + w = 1$ $w = -7$ $f(x) = \frac{1}{2}(x^2 + 4x + 4) - 7$ $f(x) = \frac{1}{2}x^2 + 2x - 5$	$\checkmark_A$ substituting $(2; 1)$ $\checkmark_A$ value of w $\checkmark_A f(x) = \frac{1}{2}(x^2 + 4x + 4) - 7$ (3)
4.6	Minimum value of $f = -7$ $\therefore -7 < k < -5$	$\checkmark_A$ minimum value of f $\checkmark\checkmark_{CA}; A$ answer (3)
4.7	$\frac{1}{2}x^2 + 2x - 5 = -x + 3$ $\frac{1}{2}x^2 + 3x - 8 = 0$ $x^2 + 6x - 16 = 0$ $(x+8)(x-2) = 0$ $x = -8$ or $x = 2$ $\therefore -8 < d < 2$ OR $d \in (-8; 2)$	$\checkmark_A$ equating $\checkmark_A x = -8$ $\checkmark\checkmark_{CA} A$ answer (4)
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Marking Guideline

QUESTION 5

5.1	$D(1; 0)$	✓ A answer (1)
5.2	$f(x) = \log_b x$ Subst. $\left(\frac{1}{4}; 1\right): 1 = \log_b \left(\frac{1}{4}\right)$ $b = \frac{1}{4}$	✓ A substituting $\left(\frac{1}{4}; 1\right)$ ✓ CA value of b (2)
5.3	$k(x) = mx - 3$ Subst. $(1; 0): 0 = m(1) - 3$ $m = 3$ OR $m = \frac{-3 - 0}{0 - 1}$ $= 3$	✓ CA substituting x -intercept ✓ CA value of m OR ✓ CA substitution ✓ CA answer (2)
5.4	$x > 0$ OR $x \in (0; \infty)$	✓ A answer (1)
5.5	$f(x) = \log_{\frac{1}{4}} x$ $f^{-1}(x): x = \log_{\frac{1}{4}} y$ $y = \left(\frac{1}{4}\right)^x$ OR $y = (4)^{-x}$	✓ A $f^{-1}(x): x = \log_{\frac{1}{4}} y$ ✓ CA answer (2)
5.6	$f^{-1}(x) = \frac{1}{4}$ If $\left(\frac{1}{4}\right)^x = \frac{1}{4}$, then $x = 1$ If $\left(\frac{1}{4}\right)^x = 16$, then $x = -2$ $-2 \leq x \leq 1$	✓ CA $x = -2$ ✓ CA ✓ A answer (3)
5.7		f^{-1} : ✓ A shape ✓ A y -intercept k^{-1} : ✓ A shape ✓ A y -intercept (4)



Marking Guideline

QUESTION 6

6.1.1	$1 + i_e = \left(1 + \frac{i_N}{m}\right)^m$ $i_e = \left(1 + \frac{0,0715}{4}\right)^4 - 1$ $i_e = 7,34\% \text{ p.a.}$	✓ A substitution ✓ CA answer (2)
6.1.2	$A = P(1+i)^n$ $17\,628,78 = 10\,000 \left(1 + \frac{0,0715}{4}\right)^{4n}$ $\left(1 + \frac{0,0715}{4}\right)^{4n} = \frac{17628,78}{10\,000}$ $4n = \log_{\left(1 + \frac{0,0715}{4}\right)} \left(\frac{17628,78}{10\,000}\right)$ $4n = 32$ $n = 8 \text{ years}$ OR $A = P(1+i)^n$ $17\,628,78 = 10\,000(1+0,0734)^n$ $(1+0,0734)^n = \frac{17\,628,78}{10\,000}$ $n = \log_{(1+0,0734)} \left(\frac{17628,78}{10\,000}\right)$ $n = 8 \text{ years}$	✓ A substitution into correct formula ✓ CA isolate $\left(1 + \frac{0,0715}{4}\right)^{4n}$ ✓ CA use of logarithms ✓ CA answer (4)
	$A = P(1+i)^n$ $17\,628,78 = 10\,000(1+0,0734)^n$ $(1+0,0734)^n = \frac{17\,628,78}{10\,000}$ $n = \log_{(1+0,0734)} \left(\frac{17628,78}{10\,000}\right)$ $n = 8 \text{ years}$	✓ A substitution ✓ CA isolate $(1+0,0734)^n$ ✓ CA use of logarithms ✓ CA answer (4)



Marking Guideline

6.2.1	OB = present value of remaining instalments $P = \frac{x[1 - (1+i)^{-n}]}{i}$ $P = \frac{10\,492,56 \left[1 - \left(1 + \frac{0,1125}{12} \right)^{-115} \right]}{\frac{0,1125}{12}}$ $P = R736\,498,33$ OR OB = A – F $= 1000\,000 \left(1 + \frac{0,1125}{12} \right)^{125} - \frac{10\,492,56 \left[\left(1 + \frac{0,1125}{12} \right)^{125} \right]}{\frac{0,1125}{12}}$ $= R736\,498,33$	✓ A $n = 115$ in P-formula ✓ A $i = \frac{0,1125}{12}$ ✓ CA substitution into correct formula ✓ CA answer (4) OR ✓ A $n = 125$ in both formulas ✓ A $i = \frac{0,1125}{12}$ ✓ A subst. into correct formulas ✓ CA answer (4)
6.2.2	$A = P(1+i)^n$ $A = 736\,498,33 \left(1 + \frac{0,1125}{12} \right)^5$ $A = 771\,675,10$ number of instalments remaining = 110 $P_t = \frac{x[1 - (1+i)^{-n}]}{i}$ $771\,675,10 = \frac{x \left[1 - \left(1 + \frac{0,1125}{12} \right)^{-110} \right]}{\frac{0,1125}{12}}$ $0,64172198855x = 7234,454063$ $x = R11\,273,50$	✓ CA substitution into compound interest formula ✓ CA value of A ✓ A $n = 110$ ✓ CA substitution into correct formula ✓ CA answer (5)

[15]



Marking Guideline

QUESTION 7

7.1	$f(x+h) = -5x^2 - 10xh - 5h^2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-5x^2 - 10xh - 5h^2 - (-5x^2)}{h}$ $= \lim_{h \rightarrow 0} \frac{-5x^2 - 10xh - 5h^2 + 5x^2}{h}$ $= \lim_{h \rightarrow 0} \frac{-10xh - 5h^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(-10x - 5h)}{h}$ $= \lim_{h \rightarrow 0} (-10x - 5h)$ $= -10x$	✓ A value of $f(x+h)$ ✓ CA substitution ✓ CA simplifying ✓ CA factors ✓ CA answer (5)
7.2.1	$y = \frac{x^3 - 27}{x - 3}$ $y = \frac{(x-3)(x^2 + 3x + 9)}{x - 3}$ $y = x^2 + 3x + 9$ $\frac{dy}{dx} = 2x + 3$	✓ A factors ✓ CA $2x$ ✓ CA $+3$ (3)
7.2.2	$D_x \left[x \left(4 - x^{\frac{1}{2}} \right) \right]$ $= D_x \left[4x - x^{\frac{3}{2}} \right]$ $= 4 - \frac{1}{2} x^{-\frac{1}{2}}$	✓ A $4x - x^{\frac{3}{2}}$ ✓ CA 4 ✓ CA $-\frac{1}{2} x^{-\frac{1}{2}}$ (3)

Marking Guideline

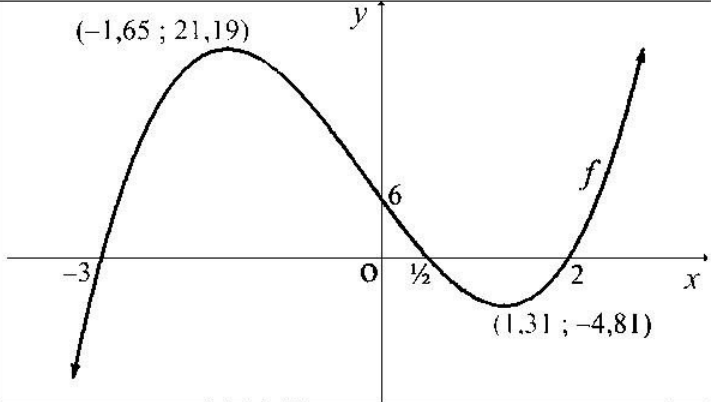
7.3	$f(x) = ax^2; \quad x > 0$ $f'(x) = 2ax$ $f'(4) = 8a$ $f^{-1}: \quad x = ay^2; \quad y > 0$ $\therefore y = \sqrt{\frac{x}{a}}$ and $f^{-1}(1) = \sqrt{\frac{1}{a}}$ $f'(4) = f^{-1}(1)$ $\therefore 8a = \sqrt{\frac{1}{a}}$ $64a^2 = \frac{1}{a}$ $a = \frac{1}{4}$	$\checkmark A \quad f'(4) = 8a$ $\checkmark A \quad f^{-1}: \quad x = ay^2$ $\checkmark CA \quad f^{-1}(1) = \sqrt{\frac{1}{a}}$ $\checkmark CA \quad \text{equating}$ $\checkmark CA \quad \text{answer}$
		(5)
		[16]

QUESTION 8

8.1	$(x-2)(2x^2+5x-3)=0$ $(x-2)(2x-1)(x+3)=0$ $x=2 \text{ or } x=\frac{1}{2} \text{ or } x=-3$	$\checkmark A \quad 2x^2+5x-3$ $\checkmark CA \quad (2x-1)(x+3)$ $\checkmark CA \quad \text{answers } (x=\frac{1}{2}; x=-3)$
		(3)
8.2	At turning points: $f'(x) = 6x^2 + 2x - 13 = 0$ $x = \frac{-(2) \pm \sqrt{(2)^2 - 4(6)(-13)}}{2(6)}$ $x = -1,65 \text{ or } x = 1,31$ Turning points: $(1,31; -4,82)$ $(-1,65; 21,19)$	$\checkmark A \quad 6x^2 + 2x - 13 = 0$ $\checkmark CA \quad \text{substitution}$ $\checkmark CA \quad \text{both } x \text{ values}$ $\checkmark CA \quad \text{both } y \text{ values}$
		(4)



Marking Guideline

8.3		✓ A shape ✓ CA x and y intercepts ✓ CA turning points	(3)
8.4	x -coordinate of point of inflection: $x = -0,17$ $x < -1,65$ or $-0,17 < x < 1,31$ OR x -coordinate of point of inflection: $x = -0,17$ $x \in (-\infty; -1,65)$ or $x \in (-0,17; 1,31)$	✓ A x -value ✓ CA $x < -1,65$ ✓✓ CA CA $-0,17 < x < 1,31$ OR ✓ A x -value ✓ CA $x \in (-\infty; -1,65)$ ✓✓ CA CA $x \in (-0,17; 1,31)$	(4)
			[14]

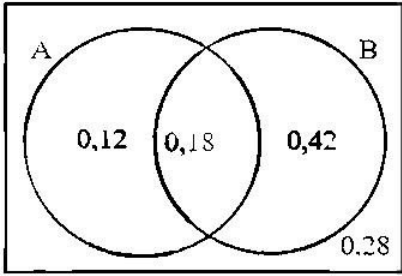
QUESTION 9

9.1	$V = \pi r^2 h = 300$ $\therefore h = \frac{300}{\pi r^2}$	✓ A $\pi r^2 h = 300$	(1)
9.2	$\begin{aligned} \text{Total surface area} &= \pi r^2 + 2\pi r h \\ &= \pi r^2 + 2\pi r \left(\frac{300}{\pi r^2} \right) \\ &= \pi r^2 + \frac{600}{r} \\ &= \pi r^2 + 600r^{-1} \end{aligned}$ $\text{For a minimum: } A'(r) = 2\pi r - 600r^{-2} = 0$ $2\pi r^3 = 600$ $r = \sqrt[3]{\frac{300}{\pi}}$ $r = 4,57 \text{ cm}$	✓ A formula ✓ CA substitution ✓ CA derivative = 0 ✓ CA $2\pi r^3 = 600$ ✓ CA value of r	(5)
			[6]



Marking Guideline

QUESTION 10

10.1.1	$P(A \text{ and } B) = P(A) \times P(B)$ Independent events $= 0,3 \times 0,6$ $= 0,18$  CA on condition: • That independent events was used; and • That probability values are between 0 and 1	$\checkmark A \quad P(A) \times P(B) = 0,3 \times 0,6$ $\checkmark A \quad 0,18$ $\checkmark CA \quad 0,12 \text{ \& } 0,42$ $\checkmark CA \quad 0,28$ (4)
10.1.2 (a)	$P(B \text{ only}) = 0,42$	$\checkmark CA \quad \text{answer}$ (1)
10.1.2 (b)	$P(B \text{ or not } A) = P(\text{not } A) + P(B) - P(\text{not } A \text{ and } B)$ $= 0,7 + 0,6 - 0,42$ $= 0,88$ OR $P(B \text{ or not } A) = 0,18 + 0,42 + 0,28$ $= 0,88$ OR $P(B \text{ or NOT } A) = 1 - P(A \text{ only})$ $= 1 - 0,12$ $= 0,88$	$\checkmark CA \quad \text{substitution}$ $\checkmark CA \quad \text{answer}$ (2) OR $\checkmark CA \quad \text{substitution}$ $\checkmark CA \quad \text{answer}$ (2) OR $\checkmark CA \quad \text{substitution}$ $\checkmark CA \quad \text{answer}$ (2)
10.2.1	$8 \times 8 \times 8 \times 8 = 8^4 = 4096$	$\checkmark A \quad \text{answer}$ (1)
10.2.2 (a)	$8 \times 7 \times 6 \times 5 = 1680$	$\checkmark A \quad \text{answer}$ (1)

Marking Guideline

10.2.2 (b)	No. of different codes starting with a '2,3 or 4' $= (3 \times 6 \times 5 \times 2) = 180$ No. of different codes starting with a '5' $= (1 \times 6 \times 5 \times 1) = 30$ Total no. of different codes $= 180 + 30 = 210$ Probability = $\frac{\text{no. of codes between 2000 and 6000}}{\text{no of codes in the sample space}}$ $= \frac{210}{1680} = \frac{1}{8} = 0,125$ OR No. of different codes ending with a '0': $= (4 \times 6 \times 5 \times 1) = 120$ No. of different codes ending with a '5' $= (3 \times 6 \times 5 \times 1) = 90$ Total no. of different codes $= 120 + 90 = 210$ Probability = $\frac{\text{no. of codes between 2000 and 6000}}{\text{no of codes in the sample space}}$ $= \frac{210}{1680} = \frac{1}{8} = 0,125$	✓ A $3 \times 6 \times 5 \times 2$ ✓ A $1 \times 6 \times 5 \times 1$ ✓ CA adding ✓ CA dividing by no in sample space ✓ CA answer (5) OR ✓ A $4 \times 6 \times 5 \times 1$ ✓ A $3 \times 6 \times 5 \times 1$ ✓ CA adding ✓ CA dividing by no in sample space ✓ CA answer (5) [14]

TOTAL: 150

