

Paper 1		
QN	TOPIC (Pls Select)	ANSWERS (<u>Exclude</u> graphs and text answers)
1	Apps of Integration (incl. polar)	$\frac{16}{3}\pi(k^6 + 3k^2 - 4), k = 2$
2	Recurrence Relations	$x_n = \frac{-2 + 5 \cdot 4^{n-1}}{3n^n}$
3	Numerical Methods	(a) $\ln \frac{x^4(x-y)}{y+x} = \frac{2x}{y+x} + c$ (b) 2.375
4	Apps of Integration (incl. polar)	(i) $2\pi a^3 \int_0^{\frac{3\pi}{2}} (t - \sin t)(1 - \cos t)^2 dt$ (ii) $\frac{1}{24}\pi a^3(81\pi^2 + 72\pi + 34)$
5	Linear Algebra	(ii)(a) $\begin{pmatrix} 0 & -a_3 & a_2 \\ a_3 & 0 & -a_1 \\ -a_2 & a_1 & 0 \end{pmatrix}$ (ii)(c) $\ker(T) = \{k\mathbf{a} \mid k \in \mathbb{R}\}, R(T) = \{\mathbf{v} \in \mathbb{R}^3 \mid \mathbf{a} \cdot \mathbf{v} = 0\}$
6	Linear Algebra	(i) $1, \begin{pmatrix} \cos \theta \\ \sin \theta \end{pmatrix}, \begin{pmatrix} -\sin \theta \\ \cos \theta \end{pmatrix}$
7	Numerical Methods	(ii) $\beta = 2.11$ (v) 2.06
8	Differential Equations	(a) $v = \frac{C - (C - kv_0)e^{-\frac{kt}{m}}}{k}$
9	Recurrence Relations	(a)(i) $u_r = \left(\frac{1}{2}\right)^r \left(A \sin \frac{r\pi}{3} + B \cos \frac{r\pi}{3}\right)$ (a)(ii) $\frac{8}{9}u_1$ (b)(ii) $a_n = \frac{1}{4}(-1)^n + \frac{3}{4}(3)^n$
10	Conics	(i) $a = 2.56, e = 0.365$ (ii) 41.4 days (iii) 5.84 days; 287 days
11	FM P1 Q11 Topic	
12	FM P1 Q12 Topic	
13	FM P1 Q13 Topic	
14	FM P1 Q14 Topic	
Paper 2		
QN	TOPIC (Pls Select)	ANSWERS (<u>Exclude</u> graphs and text answers)

1	Mathematical Induction	$\frac{1}{2}$
2	Linear Algebra	(ii)(a) yes (ii)(b) no
3	Numerical Methods	(i) $\frac{80}{9}$ (ii) overestimate (iii) $\frac{220}{27}$ (iv) $\frac{80}{9\ln 3}$ (vi) 0.705%
4	Differential Equations	(b) $y = -\frac{20}{27}e^{-6x} - \frac{16}{27}e^{-3x} + \frac{16}{9}x + \frac{4}{3},$ $z = \frac{20}{27}e^{-6x} - \frac{8}{27}e^{-3x} + \frac{32}{9}x - \frac{4}{9}$
5	Complex Numbers	(a) $e^{-i\left(\frac{11\pi}{12}\right)}, e^{-i\left(\frac{5\pi}{12}\right)}, e^{i\left(\frac{\pi}{12}\right)}, e^{i\left(\frac{7\pi}{12}\right)}$ (d) $e^{-i\left(\frac{5\pi}{12}\right)}$
6	Hypo Testing & Confidence Intervals	(a) (0.7550, 0.8006) (b) 1170
7	Chi-square Tests	Do not reject. No change.
8	Non-parametric Tests	(b) Do not reject (c) $1.4 < b < 1.6$
9	Continuous RV	(a) $\frac{2}{25}(1-y), -4 < y < 1$ (b) $-\frac{7}{3}$
10	Discrete RV	(ii) 0.107 (iii) 0.655 (iv) $\frac{1}{72}e^{-\frac{1}{72}t}, t > 0$ (v) 86
11	Hypo Testing & Confidence Intervals	(i) (1-sample) t test (ii) 3.34 (iii) Do not reject
12	FM P2 Q12 Topic	
13	FM P2 Q13 Topic	
14	FM P2 Q14 Topic	