

Paper 1		
QN	TOPIC (Please Select)	ANSWERS (<u>Exclude graphs and text answers</u>)
1	Differentiation & Applications	$\frac{dh}{dt} = \frac{300}{625\pi} = \frac{12}{25\pi}$
2	Equations & Inequalities	$1 < x < \frac{1}{a}$ $x < \frac{1}{a}$ or $x > 1$.
3	Sigma Notation & MOD	$\ln\left(\frac{2 + \alpha^{n+2}}{2 + \alpha^2}\right)$ -0.158
4	Maclaurin & Binomial Series	$y = 1 + x - \frac{3}{2}x^2 + \dots$
5	Complex Numbers	$c = -13a = 52$ -4 and $2 + 3i$ $-2 \leq c \leq 2$
6	APGP	165.88
7	Vectors	165.5° $ b = 0.340$
8	Graphs & Transformations	$\lambda < -4$ $\therefore y = \frac{x}{x-1}$
9	Differentiation & Applications	$x = \frac{\pi}{6} - \frac{\sqrt{3}}{2}$ $\frac{3}{2}\text{ms}^{-1}$ 3.341 m
10	Differential Equations	$v = \sqrt{2000(1 - e^{-0.01x})} = 20\sqrt{5(1 - e^{-0.01x})} \quad \therefore v \geq 0$ 44.7ms^{-1}
11	Functions	$\alpha + \beta = 24$ $\left(50\ln\left(13\cos\left(\frac{\pi}{24}s\right) + 25\right) - 150, 50\ln 38 - 150\right)$

Paper 2

QN	TOPIC <i>(Please Select)</i>	ANSWERS <i>(Exclude graphs and text answers)</i>
1	Differentiation & Applications	1:2
2	Vectors	$s = \frac{2}{3}(t + 2)$ $x - 3y + 9z = 11$ $\begin{pmatrix} 0 \\ -2 \\ 2 \end{pmatrix}$
3	Complex Numbers	$\angle POQ = \frac{\pi}{3}$ or $\frac{2\pi}{3}$
4	Integration & Applications	$(2x + 2)e^{x^2 + 2x}$ $\frac{1}{2}(x + 1)^2 e^{x^2 + 2x} - \frac{1}{2}e^{x^2 + 2x} + C$ $\frac{\pi a^2}{4}$ $\left(\frac{4\sqrt{2}}{3} - \frac{7}{6}\right) \text{ units}^2$ $\frac{7\pi}{6}$
5	PnC & Probability	$\therefore 0.15 < P(B \cap C) \leq 0.3$
6	PnC & Probability	$({}^{10}C_2 - 3) \times 8!$ $= 1693440$ $\frac{1}{490}$ 2304 6561
7	DRV	$\frac{2}{3}$
8	Normal Distribution	45.3 0.982 0.0125
9	Hypothesis Testing	$p\text{-value} = 0.0028373$
10	Binomial Distribution	0.157 $P(X = 0) = 0.0352$ (to 3 s.f.) 0.541 0.119 16