Candidates' performance

Module 1

Section A

Question Number		Performance in General
1	(a)	Very good. A minority of candidates, however, did not simplify the results obtained.
	(b)	Very good. A minority of candidates, however, did not reject the negative root $\frac{-8}{3}$.
2		Fair. Many candidates failed to find a suitable substitution or did wrong calculation in substitution. Some found the value of the flat at the beginning of 2014 instead of the percentage change.
3	(a)	Very good.
	(b)	Very good. Candidates performed well in plotting graphs, but a small number of them did not use the plotting to estimate the values of a and k.
4	(a)	Good. Some candidates wrote $\sqrt[3]{\frac{3x-1}{x-2}}=\left(\frac{3x-1}{x-2}\right)^{3/2}$. Some did not use logarithmic differentiation.
	(b)	Fair. Some candidates did not use the result in (a). Some wrote $\frac{d^2y}{dx^2}=\left(\frac{dy}{dx}\right)^2$, $\frac{d}{dx}\left(\frac{1}{y}\cdot\frac{dy}{dx}\right)=-y^{-2}\frac{d^2y}{dx^2}$ or $\frac{d}{dx}\left(\frac{1}{y}\cdot\frac{dy}{dx}\right)=\frac{1}{y}\cdot\frac{d^2y}{dx^2}-\frac{1}{y^2}\frac{dy}{dx}$.
5	(a)	Satisfactory. Some candidates omitted the constant of integration or wrote $\int e^{2x}\,dx=2e^{2x}+C$ while others mixed S with L.
	(b)	Satisfactory. Some candidates treated e^{2x} as the slope of L and wrote $y=e^{2x}x+1$ as the equation of L.
	(c)	Poor. Some candidates regarded $y=e^{2x}$ as the equation of S.
6	(a)	Good. Some candidates failed to perform the standardisation related to the distribution of a sample mean correctly.
	(b)	Satisfactory. Many candidates found the sample proportion but failed to find the confidence interval required.
7	(a)	Excellent.
	(b)	Very good.
	(c)	Poor. A few candidates used the Poisson distribution with mean 2λ. Many failed to consider all the events related to the required probability when using the Poisson distribution with mean λ.
8	(a)	Excellent.
	(b)	Satisfactory. Quite a number of candidates did not understand the concept of independence — some calculated $P(F\cap G)$ using $P(F)\times P(G)$ and some mixed up independent events with mutually exclusive events.
9	(a)	Good. Nevertheless, some candidates did not figure out that the required probability was $0.73\,P(X\geq 43)+0.27\,P(Y\geq 43)$, and some failed to use the standard normal distribution table.
	(b)	Satisfactory. Many candidates were able to apply the correct method, although some got wrong numerical answers.
	(c)	Fair. Some candidates wrote a binomial probability but did not use the result of (b).

Section B

Question Number			Performance in General
10	(a)	(i)	Good. Many candidates applied the trapezoidal rule correctly.
		(ii)	Poor. Many candidates used $\frac{d}{dt}\left(t^{\frac{-1}{2}}e^{\frac{-t}{2}}\right)$ instead of $\frac{d^2}{dt^2}\left(t^{\frac{-1}{2}}e^{\frac{-t}{2}}\right)$ to determine whether the estimate in (i) is an over-estimate or under-estimate.
	(b)		Fair. Many candidates used wrong substitutions.
	(c)		Very poor. Only a few candidates attempted this part. Among them, some wrote $I\approx 0.692913377$ instead of $I<0.692913377$.
11			A common mistake was to mix up R with $\frac{dR}{dt}$.
	(a)		Fair. However, many candidates knew that maximum intensity implied $\frac{dR}{dt}=0$
	(b)		Poor. Some candidates were not able to choose a suitable substitution to solve for R, while others did not go on after substitution or made careless mistakes in further calculations.
	(c)		Very poor. A common mistake was $R\|_{t=41}-R\|_{t=40}=\ln\frac{61}{50}$.
	(d)		Very poor. Only a few candidates attempted this part. Among them, some forgot to square the denominator when applying quotient rule to calculate $\frac{d^2R}{dt^2}$.
12	(a)	(i)	Good. However, some candidates used the standard deviation of the sample instead of the population, used values other than 1.645, or interchanged the upper and lower confidence limits.
		(ii)	Fair. Besides mistakes similar to (i), many candidates did not write the width of the confidence interval correctly or failed to solve inequalities.
	(b)	(i)	Good. Most candidates were able to express the probability of the mentioned event, but some failed in the standardisation of normal distributions.
		(ii)	Satisfactory. Binomial coefficients were omitted or written wrongly by some candidates.
13	(a)		Excellent. However, a small number of candidates forgot the formula of Poisson probabilities.
	(b)		Satisfactory. Some candidates failed to write all the terms needed in the numerator.
	(c)	(i)	Satisfactory. Many candidates were able to apply the correct method, although some got wrong numerical answers.
		(ii)	Poor. Most candidates failed to identify all the events related to the probability required and some even used 4.6 instead of 2.3 as the mean of the Poisson distribution.

General comments and recommendations

1. Candidates should be more careful when writing notations and performing calculations.

2. Candidates should not write 'ln' as 'In' for natural logarithm.

3. Candidates should pay more attention to the accuracy required for final answers.