Question	Answer	Marks	Partial Marks
8(b)	$BC^2 = \left(2\sqrt{3}+1\right)^2 + \left(4\sqrt{3}-2\right) -2\left(2\sqrt{3}+1\right)\left(4\sqrt{3}-2\right)\cos 30$	**M1**	Correct use of cosine rule with *their AC*.
	$BC^2 = \left[13+4\sqrt{3}\right]+\left[52-16\sqrt{3}\right] +\left[-22\sqrt{3}\right]$	**A2**	**A1** for one correct expanded bracket **A1** for the other two correct expanded brackets
	$BC^2 = 65-34\sqrt{3}$	**A1**	
9(a)	$2\mathbf{b}+\mathbf{a}$	**B1**	
9(b)	$2\mathbf{a}-2\mathbf{b}$	**B1**	
9(c)	$2\mathbf{b}+\mathbf{a}+\mu(2\mathbf{a}-2\mathbf{b})$	**B1**	**FT** on *their* $\overrightarrow{OQ}$ and $\overrightarrow{QR}$ isw
9(d)	$\lambda\left(3\mathbf{a}+\mathbf{b}\right)$	**B1**	$\lambda 3\mathbf{a}+\mathbf{b}$ is B0
9(e)	$3\lambda = 1+2\mu$ $\lambda = 2-2\mu$ $\lambda = \frac{3}{4}$, $\mu = \frac{5}{8}$	**3**	**M1** for forming two simultaneous equations equating correct terms. Each equation must have 3 terms. **M1Dep** for attempting to solve by removing μ or λ to $\lambda =$ or $\mu =$ **A1** for both
9(f)	$\frac{QX}{XS} = \frac{5}{3}$	**B1**	**FT** Must be positive from $\mu < 1$
9(g)	$\frac{OR}{OX} = \frac{4}{3}$	**B1**	**FT** Must be positive from $\lambda < 1$
10(a)	$P+Q = 500$ and $P+Q\mathrm{e}^2 = 600$	**B1**	
	$Q = \frac{100}{(\mathrm{e}^2-1)} = 15.7$ or 15.6	**2**	**M1** for attempt to solve by removing P from two equations both containing 3 terms **A1** awrt
	$P = 484$ or 485	**A1**	awrt
10(b)	$B = 484.3+15.65\mathrm{e}^4 = 1338$	**B1**	Integer value rounded down from 1338… if seen.

Question	Answer	Marks	Partial Marks
10(c)	$e^{2t} = \frac{1000000 - 484.3}{15.65}$	**M1**	Make e^{2t} the subject
	$2t = \ln\left(\frac{1000000 - 484.3}{15.65}\right)$	**M1**	Take logs correctly where $e^{2t} > 0$ or $e^n > 0$
	$\left[t = 5.5(3) \text{ or } t = 5.5\ldots.\right] \rightarrow$ 6th week.	**A1**	nfww
11(a)	$\text{LHS} = \frac{\sin x \times \frac{\sin x}{\cos x}}{1 - \cos x}$	**M1**	Uses $\tan x = \frac{\sin x}{\cos x}$
	$= \frac{1 - \cos^2 x}{\cos x(1 - \cos x)}$	**M1**	**Dep** Uses $\sin^2 x = 1 - \cos^2 x$ to eliminate $\sin x$
	$\frac{(1 - \cos x)(1 + \cos x)}{\cos x(1 - \cos x)} = \frac{1 + \cos x}{\cos x} = \sec x + 1$	**2**	**M1Dep** Factorise correctly and cancel correctly. **A1** Uses $\frac{1}{\cos x} = \sec x$
11(b)	$5\frac{\sin x}{\cos x} - 3\frac{\cos x}{\sin x} = \frac{2}{\cos x}$	**B1**	Change tan *x*, cot *x* and sec *x* into sin *x* and cos *x* correctly.
	$5\sin^2 x - 3(1 - \sin^2 x) = 2\sin x$	**M1**	Multiply correctly by $\sin x \cos x$ and use $\cos^2 x + \sin^2 x = 1$
	$8\sin^2 x - 2\sin x - 3 = 0$	**A1**	Three term quadratic.
	$(2\sin x + 1)(4\sin x - 3) = 0$	**M1**	Factorise or use formula on *their* quadratic
	$\sin x = -\frac{1}{2} \rightarrow x = 210°, 330°$	**A1**	
	$\sin x = \frac{3}{4} \rightarrow x = 48.6°, 131.4°$	**A1**	