Question	Answer	Marks	Partial Marks
6	$\frac{(x+1)^2}{x^2}=\frac{x^2+2x+1}{x^2}=1+\frac{2}{x}+\frac{1}{x^2}$	**2**	**B1** for expanding numerator seen anywhere. **M1** for attempt to divide *their* three term numerator by x^2.
	$\int 1+\frac{2}{x}+\frac{1}{x^2}\mathrm{d}x=x+2\ln x-\frac{1}{x}+(c)$	**2**	**A2/1/0** minus 1 each error or omission.
	$\left[4-2\ln 4-\frac{1}{4}\right]-\left[2+2\ln 2-\frac{1}{2}\right]$	**M1**	**Dep** insert 4 and 2 into *their* three or two term integrand and subtract correctly.
	$=\frac{9}{4}+2\ln 2$	**A1**	oe must be exact two terms. isw
7 (a)	$a=3 \quad r=\frac{2.4}{3}=0.8$	**B1**	
	$S_8=\frac{3(1-0.8^8)}{(1-0.8)}$	**M1**	Inserts *their* a and r into S_8
	= 12.48 awrt or 12.5	**A1**	
7(b)	$S_\infty=\frac{3}{(1-0.8)}=15$	**B1**	
7(c)	$S_n = 15(1-0.8^n) > 0.95\times 15$	**M1**	*their* correctly produced $S_n > 0.95S_\infty$
	$0.8^n < 0.05$	**A1**	oe
	$n < \frac{\log 0.05}{\log 0.8}$ or $n<\log_{0.8}0.05$	**M1**	**Dep** takes logs correctly of *their* expression with power of n.
	$n = 14$	**A1**	nfww
8(a)	$\frac{1}{2}(2\sqrt{3}+1)AC\sin 30° = \frac{11}{2}$	**M1**	Correct use of area of a triangle
	$(2\sqrt{3}+1)AC = 22$	**A1**	oe
	$AC=\frac{22}{(2\sqrt{3}+1)}\times\frac{(2\sqrt{3}-1)}{(2\sqrt{3}-1)}$	**M1**	Multiply by *their* $(2\sqrt{3}+1)$
	$AC = 4\sqrt{3}-2$	**A1**	

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.