Question	Answer	Marks	Partial Marks
8(a)	$\frac{\mathrm{d}}{\mathrm{d}x}(\mathrm{e}^{4x}) = 4\mathrm{e}^{4x}$	**B1**	
	$8x\mathrm{e}^{4x} + 2\mathrm{e}^{4x}$ isw	**B1**	**FT** *their* $k\mathrm{e}^{4x}$
8(b)	Use of part (a) $\int 8x\mathrm{e}^{4x}\,\mathrm{d}x = 2x\mathrm{e}^{4x} - \int 2\mathrm{e}^{4x}\,\mathrm{d}x$ oe	**B1**	**FT** part **(a)** providing of form $kx\mathrm{e}^{4x} + 2\mathrm{e}^{4x}$
	$\int x\mathrm{e}^{4x}\,\mathrm{d}x = \frac{1}{4}x\mathrm{e}^{4x} - \frac{1}{4}\int \mathrm{e}^{4x}\mathrm{d}x$ oe	**M1**	**FT** part **(a)** providing of form $kx\mathrm{e}^{4x} + 2\mathrm{e}^{4x}$
	$\frac{x\mathrm{e}^{4x}}{4} - \frac{\mathrm{e}^{4x}}{16} + c$ oe	**A2**	**A1** for any 2 terms correct
9(a)	$\sqrt{40^2 + (-9)^2}$ soi	**M1**	
	$\frac{40}{41}\mathbf{i} - \frac{9}{41}\mathbf{j}$ oe	**A1**	mark final answer
9(b)(i)	$0 < k < 1$	**B1**	
9(b)(ii)	$\overrightarrow{OR} = \mathbf{p} + k(\mathbf{q} - \mathbf{p})$ or $\overrightarrow{OR} = \mathbf{q} + (1-k)(\mathbf{p} - \mathbf{q})$	**M1**	
	$\overrightarrow{OR} = (1-k)\mathbf{p} + k\mathbf{q}$	**A1**	
	$\lambda + \mu = 1 - k + k = 1$	**A1**	

Question	Answer	Marks	Partial Marks
10	$A(1.5, 3.75)$ soi	**B1**	
	Factorises or solves $3+2x-x^2=0$	**M1**	
	$C(3, 0)$ soi	**A1**	implies **M1**
	$\frac{dy}{dx}=2-2x$, when $x = 1.5$ $\frac{dy}{dx}=-1$	**B1**	
	$y-3.75=-(x-1.5)$ oe leading to $B(5.25, 0)$ soi	**B2**	**B1** for $y-3.75=-(x-1.5)$ oe
	$\frac{1}{2}\times(5.25-1.5)\times 3.75$ $5.25^2-\frac{5.25^2}{2}-\left(5.25(1.5)-\frac{1.5^2}{2}\right)$	**B1**	OR $\frac{1}{2}\times(5.25-3)\times 2.25$ $5.25^2-\frac{5.25^2}{2}-\left(5.25(3)-\frac{3^2}{2}\right)$
	$\left[\int_{1.5}^{3}(3+2x-x^2)\,dx=\left[F(x)\right]_{1.5}^{3}=\right]$ $\left[3x+\frac{2x^2}{2}-\frac{x^3}{3}\right]_{1.5}^{3}$	**M1**	OR $\left[\int_{1.5}^{3}(2.25-3x+x^2)\,dx=\left[G(x)\right]_{1.5}^{3}=\right]$ $\left[2.25x-\frac{3x^2}{2}+\frac{x^3}{3}\right]_{1.5}^{3}$ oe
	$\left(their\ \frac{225}{32}\right)-\left(F(3)-F(1.5)\right)$	**M1**	**dep** on at least 2 correct terms in the integration OR $\left(G(3)-G(1.5)\right)+\left(their\ \frac{81}{32}\right)$
	$\frac{117}{32}$ or 3.65625	**A1**	
11(a)	$[S_{20}=]\frac{20}{2}\{2a+19d\}=1100$ oe	**B1**	
	$[S_{70}=]\frac{70}{2}\{2a+69d\}=14350$ oe	**B1**	
	Solves *their* linear equations in a and d	**M1**	**dep** on at least **B1** and an attempt to form the other equation using the sum formula
	$a=-2$, $d=6$	**A2**	**A1** for each
	$[u_{12}=-2+11\times 6=]\,64$	**B1**	