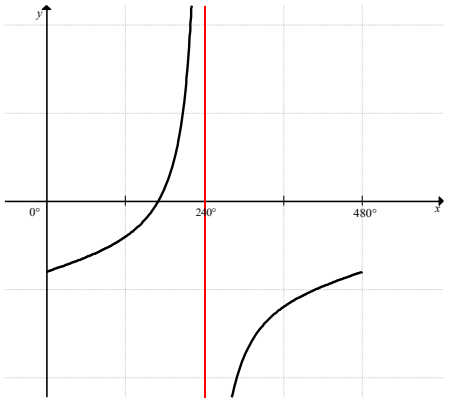
Question	Answer	Marks	Partial Marks
3(b)	$\left(2\sqrt{x}-3\right)\left(\sqrt{x}-4\right)$ or $x = u^2$ and $(2u – 3)(u – 4)$ oe soi	**M1**	
	$\sqrt{x}=\frac{3}{2},\ \sqrt{x}=4$ oe	**A1**	
	$x=\frac{9}{4}$, $x = 16$	**B1**	**FT** their $\sqrt{x}$
	Alternative $(2x+12)^2=\left(11x^{\frac{1}{2}}\right)^2$ simplified to $4x^2-73x+144=0$	**(M1)**	
	solves 3 term quadratic in x	**(M1)**	
	$x=\frac{9}{4}$, $x = 16$	**(A1)**	
4(a)	$a = –4$	**B1**	
	$480=\frac{180}{b}$ oe	**M1**	
	$b=\frac{3}{8}$	**A1**	
4(b)	Correct sketch  	**B2**	correct tan shape, two branches starting and finishing on same negative y value asymptote implied at $x = 240$ root between 120 and 240 **B1** for correct tan shape with exactly two branches plus one other correct property Maximum **B1** if not fully correct

Question	Answer	Marks	Partial Marks
5	$27x = (x^2)^2$ or $y = \left(\frac{y^2}{27}\right)^2$ oe	**M1**	if **M0** then, for first 4 marks, **SC4** if (3, 9) only stated and verified in both equations, ignore (0, 0) or **SC2** for (3, 9) only stated with no working, ignore (0, 0) If first **M1** then (3, 9) with no additional working award **M1SC1**
	$x^4 - 27x = 0$ or $y^4 - 729y = 0$ oe nfww	**A1**	
	$x(x^3 - 27) = 0$ or $y(y^3 - 729) = 0$ oe	**M1**	
	$A(3, 9)$ oe only nfww	**A1**	
	Mid-point = $(1.5, 4.5)$	**B1**	
	$m_{OA} = \frac{9}{3}$ oe	**B1**	
	$m_{\perp} = -\frac{3}{9}$ oe	**M1**	
	$y - 4.5 = -\frac{3}{9}(x - 1.5)$ oe isw	**A1**	**FT** *their* mid-point and *their* $-\frac{1}{\frac{9}{3}}$
6	$\frac{\mathrm{d}(\mathrm{e}^{\frac{x}{2}})}{\mathrm{d}x} = \frac{1}{2}\mathrm{e}^{\frac{x}{2}}$	**B1**	
	$\frac{\mathrm{d}(\cos 2x)}{\mathrm{d}x} = -2\sin 2x$ soi	**B1**	
	$x \times$ *their*$(-2\sin 2x) + \cos 2x$	**M1**	
	$\left[\frac{\mathrm{d}y}{\mathrm{d}x} =\right] \frac{1}{2}\mathrm{e}^{\frac{x}{2}} - 2x\sin 2x + \cos 2x$	**A1**	**FT** *their* $\frac{\mathrm{d}\left(\mathrm{e}^{\frac{x}{2}}\right)}{\mathrm{d}x} = k\mathrm{e}^{\frac{x}{2}}$
	$\frac{\delta y}{h} = \textit{their}\left.\frac{\mathrm{d}y}{\mathrm{d}x}\right\|_{x=1}$	**M1**	
	$-1.41[03...]h$ nfww	**A1**	