7	**(a)**		ke^{kx}	**B1** **[1]**	**1.2**	Ignore "$y =$" if seen	
7	**(b)**		(Gradient of tangent is) $\frac{1}{2}e^{\frac{1}{2}\times 2}$ ignore eg "$y =$" $= \frac{1}{2}e$ (Equation of tangent is) $y - e = \frac{1}{2}e(x-2)$ or $y = \frac{1}{2}ex + c$ AND sub (2, e) $y = \frac{1}{2}ex$ (cao), Passes through (0, 0) or $x = 0 \Rightarrow y = 0$ or y-int is 0 oe	**M1** **A1f** **M1** **A1** **[4]**	**1.1a** **1.1** **1.1** **2.2a**	Subst $k = \frac{1}{2}$ $x = 2$ into their (a) ft (a) May be implied by next line M1 for attempt find equation of tangent by correct method or verify, eg: $0 - e = \frac{1}{2}e(0-2)$ | $y - 1.36x = 0$ so $-e = -e$ | $0 - 1.36\times 0 = 0$	Allow decimals throughout May be implied by 1.36 or 1.35 ft (a) ft their gradient, so long as it involves e (possibly implied by decimal) A1 for obtain **correct** equation and state or show or verify that it passes thro' (0, 0) **No ft.**

7	**(c)**		$3e^{x} = 1 - 2e^{\frac{1}{2}x}$	**M1**	**3.1a**	oe	Allow decimals throughout
			$3(e^{\frac{1}{2}x})^2 + 2e^{\frac{1}{2}x} - 1 = 0$ or eg $3u^2 + 2u - 1 = 0$ or $3y + 2\sqrt{y} - 1 = 0$	**M1**	**3.1a**	Attempt write quadratic equation in $e^{\frac{1}{2}x}$ or attempt a substitution and form QE Allow one sign error	Allow substitute x or $y = e^{\frac{1}{2}x}$
			$((3e^{\frac{1}{2}x} - 1)(e^{\frac{1}{2}x} + 1) = 0)$			May not be seen	
			$e^{\frac{1}{2}x} = -1$: no solutions stated	**B1**	**2.3**	eg "Cannot be negative" or "Impossible" or just "X"	
			$e^{\frac{1}{2}x} = \frac{1}{3}$ oe	**A1**	**2.1**	or $\frac{1}{2}x = \ln\frac{1}{3}$ or $\frac{1}{2}x = -1.10$	not just eg $u = \frac{1}{3}$
			$x = 2\ln\frac{1}{3}$ or $\ln\frac{1}{9}$ or $-2\ln 3$ or $-\ln 9$ or -2.20	**A1**	**1.1**		
			$y = 3\exp(\ln\frac{1}{9}) = \frac{1}{3}$ or 0.333				
			Point of intersection is $(\ln\frac{1}{9}, \frac{1}{3})$	**A1**	**2.2a**	or equivalent exact or (–2.20, 0.333) (3 sf) If any extra points of intersection: A0	Correct ans, with no working or irrelevant working: SC B2
				[6]			