Question	Answer	Marks	Guidance
(a)	$4\times0^2-0+\frac{1}{2}k^2=0-a$	**M1**	Equating the equations of curve and line and substituting $x=0$. Condone slight errors e.g. ± sign errors.
	$4\times\left(\frac{3}{4}\right)^2-\frac{3}{4}k+\frac{1}{2}k^2=\frac{3}{4}-a$	**M1**	Equating the equations of curve and line and substituting $x=\frac{3}{4}$. Condone slight errors e.g. ± sign errors.
	$k=2,\ \ a=-2$	**A1 A1**	WWW
	Alternative method for question 5(a)		
	$(x-0)\left(x-\frac{3}{4}\right)=0$ or $x(4x-3)=0$ [$\Longrightarrow\ 4x^2-3x=0$]	***M1**	Use 0, $\frac{3}{4}$ to form a quadratic equation. **Do not allow** $(x+0)\left(x+\frac{3}{4}\right)=0$.
	$4x^2-kx+\frac{1}{2}k^2=x-a$ leading to $4x^2-(k+1)x+\frac{1}{2}k^2+a[=0]$	**DM1**	Equating the equations of curve and line and rearranging so that terms are all on same side. Condone slight errors e.g. ± sign errors.
	$k=2,\ \ a=-2$	**A1 A1**	WWW
	Alternative method for question 5(a)		
	$-\frac{b}{a}=\frac{3}{4}+0$ and $\frac{c}{a}=0\times\frac{3}{4}$	***M1**	Using sum and product of roots. Condone ± sign errors.
	$\frac{k+1}{4}=\frac{3}{4}$ and $\frac{\frac{1}{2}k^2+a}{4}=0$	**DM1**	Equating the equations of curve and line and equating to $\frac{3}{4}$ and 0.
	$k=2,\ \ a=-2$	**A1 A1**	WWW
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Question	Answer	Marks	Guidance
(b)	$4x^2 - kx + \frac{1}{2}k^2 = x + \frac{7}{2} \Rightarrow 4x^2 - kx - x + \frac{1}{2}k^2 - \frac{7}{2}[=0]$	***M1**	OE Substitute $a = -\frac{7}{2}$ and rearrange so that terms are all on same side, condone ± sign errors. Watch for multiples.
	$(k+1)^2 - 4 \times 4\left(\frac{1}{2}k^2 - \frac{7}{2}\right)$	***DM1**	Use of $b^2 - 4ac$ with the coefficients from *their* 3-term quadratic. Both coefficients 'b' and 'c' must consist of two components.
	$\Rightarrow 7k^2 - 2k - 57$	**A1**	OE
	$(k-3)(7k+19)$ or other valid method	**DM1**	Factorising or use of the formula or completing the square. Must be evidence of an attempt to solve for this mark. Dependent upon both previous method marks.
	$k = 3, k = -\frac{19}{7}$	**A1**	OE e.g. AWRT -2.71. No ISW if inequalities used. **SC:** If second DM1 not scored, **SC B1** available for correct final answers.
	Alternative method for question 5(b)		
	$8x - k = 1$ **and** $4x^2 - kx + \frac{1}{2}k^2 = x + \frac{7}{2}$	***M1**	Equating gradients and equating line and curve.
	$4x^2 - (8x-1)x + \frac{1}{2}(8x-1)^2 = x + \frac{7}{2}$ **or** $4(\frac{k+1}{8})^2 - k\left(\frac{k+1}{8}\right) + \frac{1}{2}k^2 = \frac{k+1}{8} + \frac{7}{2}$	***DM1**	Forming an equation in x or k only.
	$28x^2 - 8x - 3$ or $7k^2 - 2k - 57$	**A1**	OE A correct 3 term quadratic in x or k only.
	$(14x+3)(2x-1)$ or $(k-3)(7k+19)$ or other valid method	**DM1**	OE Factorising or use of the formula or completing the square. Must be evidence of an attempt to solve for this mark. Dependent upon both previous method marks.
(b)	$k = 3, k = -\frac{19}{7}$	**A1**	OE e.g. AWRT -2.71. No ISW if inequalities used. **SC:** If second DM1 not scored, **SC B1** available for correct final answers.
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