Question	Answer	Marks	Guidance
(a)	Express as $(x+3)^2+(y-1)^2=26+9+1[=36]$	M1	Completing the square on x and y or using the form $x^2+y^2+2gx+2fy+c=0$, centre $(-g,-f)$ and radius $\sqrt{g^2+f^2-c}$. SOI by correct answer.
	Centre $(-3, 1)$	B1	
	Radius 6	B1	
	So lowest point is $(-3, -5)$	A1 FT	FT on *their* centre and *their* radius.
		4	
(b)	Intersects when $x^2+(kx-5)^2+6x-2(kx-5)-26=0$ **or** $(x+3)^2+(kx-5-1)^2=36$	*M1	Substituting $y=kx-5$ into *their* circle equation or rearranging and equating y.
	$x^2+k^2x^2-10kx+25+6x-2kx+10-26=0$ **or** $x^2+6x+9+k^2x^2-12kx+36=36$ leading to $k^2x^2+x^2+6x-12kx+9[=0]$ **or** $(k^2+1)x^2+(6-12k)x+9[=0]$	DM1 A1	Rearranging to 3-term quadratic (terms grouped, all on one side). Allow 1 error. Correct quadratic (need to see 9 as constant term).
	$(6-12k)^2-4(k^2+1)\times 9\ [>0]$ $\left[\text{leading to } 144k^2-144k+36-36k^2-36>0\right]$	DM1	Using discriminant $b^2-4ac[>0]$ with *their* values. Allow if in square root.
	[$108k^2-144k=0$ leading to] $k=0$ or $k=\frac{4}{3}$	A1	Need not see method for solving.
	$k<0, k>\frac{4}{3}$	A1	Do not accept $\frac{4}{3}<k<0$.
		6	