

Q	Marking instructions	AO	Marks	Typical solution
6(a)	<p>Begins a valid method to find the coordinates</p> <p>Uses gradient of L to find gradient of perpendicular radius</p> <p>Or</p> <p>Forms equation of circle with unknown radius and solves simultaneously with equation of L</p> <p>Or differentiates equation of circle implicitly</p>	3.1a	M1	$5y + 12x = 298$ $y = \frac{-12}{5}x + \frac{298}{5}$ $y - 9 = \frac{5}{12}(x - 7)$
	<p>Uses (7, 9) to find the equation of the radius</p> <p>Or</p> <p>Uses (7, 9) correctly in their equation of circle</p> <p>Or</p> <p>Uses $\frac{-12}{5}$ after their implicit differentiation</p>	1.1a	M1	$12y - 5x = 73$ $x = 19$ $y = 14$ $(19, 14)$
	<p>Obtains $12y - 5x = 73$ OE</p> <p>Or</p> <p>Correctly eliminates a variable to obtain a quadratic in x or y for example</p> <p>obtain a quadratic in x or y</p> $(x - 7)^2 + \left(\frac{298 - 12x}{5} - 9\right)^2 = k$ $\Rightarrow (x - 7)^2 + \left(\frac{253 - 12x}{5}\right)^2 = k$ $\left(\frac{298 - 5y}{12} - 7\right)^2 + (y - 9)^2 = k$ $\Rightarrow \left(\frac{214 - 5y}{12}\right)^2 + (y - 9)^2 = k$	1.1b	A1	
	<p>Equates discriminant to zero</p> <p>PI By correct answer</p> <p>or</p> <p>Solves their simultaneous equations of tangent and radius</p> <p>PI by correct answer</p>	3.1a	M1	
	<p>Obtains correct values for x and y</p> <p>(19, 14)</p>	1.1b	A1	
	Subtotal		5	

6(b)	Obtains $(x-7)^2 + (y-9)^2 = r^2$ PI if r^2 is replaced with correct value using their point from (a)	1.1a	M1	$(x-7)^2 + (y-9)^2 = r^2$ $(19-7)^2 + (14-9)^2 = r^2$ $12^2 + 5^2 = 169$
	Uses their point to find radius or radius squared. Must have obtained a point in part (a)	1.1a	M1	$(x-7)^2 + (y-9)^2 = 169$
	Obtains correct equation of circle CSO ACF	1.1b	A1	
	Subtotal		3	
	Question Total		8	