Q	Marking Instructions	AO	Marks	Typical Solution
11(a)	Completes the square twice or applies standard formula	AO1.1a	M1	$(x+4)^2+(y-6)^2-16-36=12$ $(x+4)^2+(y-6)^2=64$
	Obtains correct equation	AO1.1b	A1	Centre (–4, 6) Radius = 8
	Obtains correct radius and correct coordinates of *C* Follow through 'their' equation	AO1.1b	A1F	
(b)	Demonstrates a method to find the length *OP* or *OQ* (or their squares), or the coordinates *P* or *Q* using 'their' values from part **(a)**	AO3.1a	M1	$OC^2=4^2+6^2=52$ $OP^2=r^2-OC^2$ $=64-52=12$
	Uses a circle property that may lead to a solution, eg radius and chord meet at right-angles (evidence for this could be the use of Pythagoras or perpendicular gradients)	AO3.1a	M1	$PQ=2OP$ $=2\sqrt{12}=4\sqrt{3}$
	Finds *OP* or *OQ* or coordinates of *P* or *Q* **CAO**	AO1.1b	A1	
	Obtains length of *PQ* Follow through from 'their' coordinate of *P* and *Q* (Does not need to be in the required form)	AO1.1b	A1F	
	Sets out a well-constructed mathematical argument, using precise statements and correct use of symbols throughout to show the correct required result in required form Only award if they have a completely correct solution, which is clear, easy to follow and contains no slips	AO2.1	R1	
	Total		**8**	