

Question		Answer	Marks	AO	Guidance	
7	(a)	$x^2 + y^2 - 6x + 9y + 19 = 0$	M1	1.1	$(x \pm 3)^2 \pm \dots + (y \pm \frac{9}{2})^2 \pm \dots + 19 = 0$	
		$(x - 3)^2 - 9 + (y + \frac{9}{2})^2 - \frac{81}{4} + 19 = 0$				
		$C(3, -\frac{9}{2})$	A1	1.1	cao	
		Radius is $\frac{\sqrt{41}}{2}$	A1	1.1	cao (oe)	
			[3]			
7	(b)	$y = \frac{11}{\frac{55}{4}}x - 11 \left(\Rightarrow y = \frac{4}{5}x - 11 \right)$	B1	2.1	Equation of line AB (any equivalent form) – allow unsimplified	Or $m_{CD} = -\frac{5}{4}$ (Use of $m_1m_2 = -1$ with their gradient of AB) Equation of CD is $y + \frac{9}{2} = -\frac{5}{4}(x - 3)$ (using their C from (a)) Dependent on both previous M marks
		$x^2 + \left(\frac{4}{5}x - 11\right)^2 - 6x + 9\left(\frac{4}{5}x - 11\right) + 19 = 0$	M1*	3.1a	Substitute equation of line into equation of circle	
		$\frac{41}{25}x^2 - \frac{82}{5}x + 41 = 0$	M1dep*	1.1	Simplify to three-term quadratic in x (or y)	
		x -coordinate of D is 5 (or y -coordinate of D is -7)	A1	1.1	BC	
		Area of $OBD = \frac{1}{2}(11)(5)$	M1	3.2a	$\frac{1}{2}(11)(x\text{-coordinate of } D)$ or other	
		$= 27.5$	A1	1.1	complete method	
			[6]			