

Q	Marking instructions	AO	Marks	Typical solution
9(a)	States (12, 2)	1.1b	B1	(12, 2)
	Subtotal		1	

Q	Marking instructions	AO	Marks	Typical solution
9(b)	States (12, -8)	2.2a	R1	(12, -8)
	Subtotal		1	

Q	Marking instructions	AO	Marks	Typical solution
9(c)	Forms an equation for x or a by Substituting $y = 10$ into $(x-12)^2 + (y-2)^2 = 100$ or $y = 3x-36 - 8$ Or Substitutes $\pm(3x-36) - 8$ for y in the circle equation Or Forms a right-angled triangle with a hypotenuse of 10 and a shorter side of 8 and uses an appropriate process to find the length of the third side PI by a 6, 8, 10 right-angled triangle	3.1a	M1	$(a-12)^2 + (10-2)^2 = 100$ $a = 6$ or 18 $6 < 18$ $\therefore a = 6$
	Solves their equation to find a value of x or a Or Identifies 6, 8 and 10 as a Pythagorean triple PI by a 6, 8, 10 right-angled triangle	1.1a	M1	
	Completes reasoned argument to obtain $a = 6$ with a fully correct solution If a 6, 8, 10 approach is used we must see $12 - 6 = a$, $12 - 6 = 6$ or $12 - a = 6$ Accept (6, 10) NMS scores M0M0R0	2.1	R1	
	Subtotal		3	

Q	Marking instructions	AO	Marks	Typical solution
9(d)(i)	Uses an appropriate trigonometric equation to find angle ADB or $\frac{1}{2}ADB$ such as $\arctan \frac{6}{18}$ or $\arctan \frac{6}{8}$ OE PI by AWRT 18.4° or 36.9°	3.1a	M1	$\tan \frac{\theta}{2} = \frac{6}{18}$ $\theta = 0.644$
	Obtains AWRT 0.644	1.1b	A1	
	Subtotal		2	

Q	Marking instructions	AO	Marks	Typical solution
9(d)(ii)	Uses $l = r\theta$ with either $r = 10$ or $\theta = 2 \times \text{their } 0.644$ OE Condone angle in degrees	3.1a	M1	$l = 10 \times (2 \times 0.644)$ $= 12.9$
	Obtains AWWF [12.8, 12.9]	1.1b	A1	
	Subtotal		2	

	Question 9 Total		9	
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