

Q	Marking instructions	AO	Marks	Typical solution
9(a)	<p>Begins argument with either of:</p> <ul style="list-style-type: none"> Factorises $-4b-2$ or $4b+2$ correctly to $2b+1$ as a factor States $4b$ and 2 are both even or begins proof by contradiction by assuming a is odd therefore a^2 is odd 	2.1	M1	$a^2 - 4b - 2 = 0$ $a^2 = 4b + 2$ $a^2 = 2(2b + 1)$ <p>Hence a^2 must be even, which means that a must be even</p>
	<p>Completes reasoned argument by deducing that a^2 must be even or has a factor of 2, which means that a must be even or</p> <p>Completes reasoned argument by deducing that $a^2 = 4b+2$ which is even because $4b$ and 2 are both even hence a^2 is even which is a contradiction OE</p>	2.2a	R1	
	Subtotal		2	

Q	Marking instructions	AO	Marks	Typical solution
9(b)	Uses $2p$ and obtains $(2p)^2$ PI by $4p^2$ Allow any letter for p except a and b	1.1a	M1	$a = 2p \Rightarrow (2p)^2 = 4p^2$ $4p^2 = 2(2b+1)$ $2p^2 = 2b+1$
	Obtains either $4p^2 = 2(2b+1)$ or $4p^2 = 4b+2$ and followed by $2p^2 = 2b+1$ or $4p^2 = 2(2b+1)$ or $4p^2 = 4b+2$ and followed by $2 \times 2p^2 = 2(2b+1)$	3.1a	A1	Hence $2b+1$ must be even $2b+1$ is an odd number which is a contradiction
	Complete reasoned argument by deducing that $2b+1$ is even hence contradiction as $2b+1$ is an odd number or Complete reasoned argument by deducing that $2b+1$ is even hence contradiction as b cannot be an integer	2.2a	R1	
	Subtotal		3	

Q	Marking instructions	AO	Marks	Typical solution
9(c)	Deduces that there are no solutions to $a^2 - 4b - 2 = 0$ where a and b are integers	2.2a	R1	There are no solutions to $a^2 - 4b - 2 = 0$ where a and b are integers
	Subtotal		1	

	Question 9 Total		6	
--	-------------------------	--	----------	--