

Q	Marking instructions	AO	Marks	Typical solution
9	States algebraic expressions for two distinct non-consecutive odd numbers.	3.1a	M1	<p>Let <math>n = 2p + 1</math>   <math>m = 2q + 1</math></p> <p>Where <math>p</math> and <math>q</math> are integers</p> $m^2 + n^2 = (2p + 1)^2 + (2q + 1)^2$ $= 4p^2 + 4p + 1 + 4q^2 + 4q + 1$ $= 2(2p^2 + 2q^2 + 2p + 2q + 1)$ <p>Factor 2 shows it is a multiple of 2</p> <p>Factor <math>(2p^2 + 2q^2 + 2p + 2q + 1)</math> is 1 more than a multiple of 2 so <math>m^2 + n^2</math> is not a multiple of 4</p>
	Expands their two-termed expression for $m$ and $n$ in $m^2 + n^2$	1.1a	M1	
	Obtains their correct expanded expression.  Do not allow if substitutions define the same odd number.	1.1b	A1F	
	Concludes correctly that the expression is a multiple of 2  Do not allow if substitutions define consecutive odd numbers or substitutions which generate the same odd number.	2.4	E1	
	Completes a reasoned argument to conclude correctly the expression is not a multiple of 4. CAO  OE  Must not have used substitutions which involve $m$ or $n$ or define consecutive odd numbers or which generate the same odd number. CAO	2.1	R1	
<b>Question 9 Total</b>			<b>5</b>	