

Q	Marking Instructions	AO	Marks	Typical Solution
12(a)	Begins to construct a rigorous mathematical proof by generalising the form of an even number and substituting it into the given expression	AO2.1	M1	<p>Let $n = 2m$</p> $9n^2 + 6n = 9(2m)^2 + 6(2m)$ $= 36m^2 + 12m$ $= 12(3m^2 + m)$ <p>Hence 12 is a factor of the expression $9n^2 + 6n$ when n is any even number</p>
	Simplifies expression and extracts 12 as a common factor	AO1.1b	A1	
	Completes rigorous proof – well explained. A statement is required that links the factor of 12 to the expression $9n + 6n$ when n is an even number	AO2.1	R1	
(b)	Uses a counter example by substituting any odd number into the expression and shows that the resulting value is not a multiple of 12	AO2.2a	R1	<p>Let $n = 1$</p> $9(1)^2 + 6(1) = 15$ <p>12 is not a factor of 15 and hence statement is not true for all integers n</p>
	Total		4	