

Question	Scheme	Marks	AOs
<b>10(a)</b>	Selects a correct strategy. E.g uses an odd number is $2k \pm 1$	B1	3.1a
	Attempts to simplify $(2k \pm 1)^3 - (2k \pm 1) = \dots$	M1	2.1
	.....and factorise $8k^3 \pm 12k^2 \pm 4k = 4k(2k^2 \pm 3k \pm 1) =$	dM1	1.1b
	Correct work with statement $4 \times \dots$ is a multiple of 4	A1	2.4
		<b>(4)</b>	
<b>(b)</b>	Any counter example with correct statement. Eg. $2^3 - 2 = 6$ which is not a multiple of 4	B1	2.4
		<b>(1)</b>	

**(5 marks)**

<b>Alt (a)</b>	Selects a correct strategy. Factorises $k^3 - k = k(k-1)(k+1)$	B1	3.1a
	States that if $k$ is odd then both $k-1$ and $k+1$ are even	M1	2.1
	States that $k-1$ multiplied by $k+1$ is therefore a multiple of 4	dM1	1.1b
	Concludes that $k^3 - k$ is a multiple of 4 as it is odd $\times$ multiple of 4	A1	2.4
		<b>(4)</b>	

**Notes:**

**(a)**  
**Note:** May be in any variable (condone use of  $n$ )

**B1:** Selects a correct strategy. E.g uses an odd number is  $2k \pm 1$

**M1:** Attempts  $(2k \pm 1)^3 - (2k \pm 1) = \dots$  Condone errors in multiplying out the brackets and invisible brackets for this mark. Either the coefficient of the  $k$  term or the constant of  $(2k \pm 1)^3$  must have changed from attempting to simplify.

**dM1:** Attempts to take a factor of 4 or  $4k$  from their cubic

**A1:** Correct work with statement  $4 \times \dots$  is a multiple of 4

**(b)**

**B1:** Any counter example with correct statement.