

# Algebra - Proof

The  $n$ th even number is  $2n$ .

The next even number after  $2n$  is  $2n + 2$

(a) Explain why.

.....

.....

**(1)**

(b) Write down an expression, in terms of  $n$ , for the next even number after  $2n + 2$

**(1)**

(c) Show algebraically that the sum of any 3 consecutive even numbers is always a multiple of 6

**(3)**

## Algebra - Proof

The  $n$ th even number is  $2n$ .

The next even number after  $2n$  is  $2n + 2$

(a) Explain why.

Consecutive whole numbers alternate between odd and even.  
So since  $2n$  is even,  $2n+1$  is odd and  $2n+2$  is even.

(1)

(b) Write down an expression, in terms of  $n$ , for the next even number after  $2n + 2$

$$2n + 4$$

(1)

(c) Show algebraically that the sum of any 3 consecutive even numbers is always a multiple of 6

Sum can be written as:

$$\begin{aligned} & 2n + 2n+2 + 2n+4 \\ &= 6n+6 \\ &= 6(n+1) \end{aligned}$$

This is a multiple of 6  
because 6 is a factor

(3)