

# OUTLINE OF A PROOF USING "DIVISION INTO CASES"

To Prove: For every integer  $n$ ,  $n(n+1)$  is even.

Proof OUTLINE:

Let  $n$  be any integer.

By the Parity Corollary,  $n$  is even OR  $n$  is odd.

Case 1 ( $n$  is even):

Suppose  $n$  is even.

⋮

∴  $n(n+1)$  is even in Case 1. [END of Case 1]  
[OR "in the case that  $n$  is even"]]

Case 2 ( $n$  is odd):

Suppose  $n$  is odd.

⋮

∴  $n(n+1)$  is even in Case 2. [END of Case 2]  
[OR "in the case that  $n$  is odd"]]

∴  $n(n+1)$  is even in general.

∴ For every integer  $n$ ,  $n(n+1)$  is even,  
by Direct Proof.

QED