Let a and b be integers. Suppose a-b is even.
Prove a+b is even

$\mathbb{Z} \{a, b\}$

Statement	Justification
$a \, \& \, b \in \mathbb{Z}$	This was given
$a+b$ is even	This was given
$a+b$ is an $\mathbb{Z}$	Closure under addition
$a-b$ is an $\mathbb{Z}$	Closure under subtraction
$2 \mid a \to 2k = a$ $2 \mid b \to 2j = b$	By definition of even numbers
$a - b$ $2k - 2j$	By substitution
$2(k-j)$	By factoring
$2(k-j)$	$k-j$ integer closure under subtraction
$2 \mid a-b$	By definition of even numbers