Question 4

Show that the additive inverse, or negative, of an even number is an even number using a direct proof.

Suppose a is an even integer. Then there exists an integer s such that $a = 2s$. The additive inverse of a is $-a = -2s$, which is equal to $2(-s)$. Since this is 2 times the integer $-s$, the additive inverse of a is even.