**Problem 2009-2**

Consider the logistic population model ($u = u(x)$ on the interval $(-1, 1)$)

$$u''(x) + u(x)(a(x) - u(x)) = 0, \quad -1 < x < 1$$
$$u(-1) = u(1) = 0.$$

The given function $a(x)$ is continuous on $[-1, 1]$, and even (i.e. $a(-x) = a(x)$ for all $x$).

Assuming that this problem admits a positive solution (i.e. $u(x) > 0$ for $x \in (-1, 1)$), prove that this solution is an even function.