

#33 If n is any even integer, then $(-1)^n = 1$.

Proof: Let n be some even integer.

$n = 2k$, where k is some integer. By def. even

$$\begin{aligned} \text{Then } (-1)^n &= (-1)^{2k} \\ &= ((-1)^2)^k \\ &= (1)^k \\ &= 1 \end{aligned}$$

By the Laws of exponents

Thus n is an even number for $(-1)^n = 1$. By def. even
Q.E.D.