Let k be a positive integer. Let $p(x)$ be a polynomial of degree n each of whose coefficients is -1, 1 or 0, and which is divisible by $(x-1)^k$. Let q be a prime such that $\frac{q}{\ln q} < \frac{k}{\ln(n+1)}$. Prove that the complex qth roots of unity are roots of the polynomial $p(x)$.