Bilkent University
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Problem Of The Month

Term: February 2008

Suppose that the polynomial $P(x) = x^{2008} + a_{2007}x^{2007} + a_{2006}x^{2006} + \cdots + a_1x + a_0$ has 2008 real roots, while the polynomial $P(Q(x))$, where $Q(x) = \dfrac{x^2}{4} + x - 1$ has no real root. Prove that $a_0 + a_1 + \cdots + a_{2007} > 3^{2008} - 1$.