A Tauberian theorem deduces statements about the average on $[0, x]$ of a positive Borel measure $\alpha$ from the behavior of $L(s) - (s - 1)^{-1}$ in the halfplane $\Re s \geq 1$, where $L(s) = \int_0^\infty \exp(-ts)d\alpha(t)$.

Let $f_r(x) = \exp(-rx)$ for $x > 0$ and $f(x) = 0$ for $x < 0$. In 1981, S. W. Graham and J. D. Vaaler found best one-sided approximations to $f_r(x)$ by entire functions of finite exponential type and used these as tools to give sharp bounds in a Tauberian theorem for $\alpha$ under the assumption that the continuation of $L(s) - (s - 1)^{-1}$ from $\Re s > 1$ to $\Re s = 1$ is known only for $|\Im s| < T$ with some positive constant $T$.

In this talk I will address the problem of best one-sided approximation of $x^n f_r(x)$ and its connection with Tauberian theorems for integrated measures. For $n > 0$ the construction of the auxiliary approximations requires knowledge of the zeros of the generating function of the Bernoulli polynomials, $g(t, a) = t \exp(at)(\exp(t) - 1)^{-1}$ in the region $\mathbb{R} \times [0, 1]$. If time permits, I will sketch the connection. (Received October 03, 2004)