Problem 3. Let $v \in C_0^\infty(\mathbb{R})$ with $1 \in \sup p(v)$. Show that

$$\sum_{k=0}^{\infty} \int_{\mathbb{R}} \frac{1}{(k-1)!} \frac{d^k \chi_{[0,\infty)}}{dx^k} v(x)\, dx$$

is absolutely at most $| v(1) |$