Let \( \tilde{g}(k) = \sum e^{-ikx} g(x) \)

\[
\frac{d\tilde{g}(k)}{dk} = -i \int dx \ e^{ikx} g(x).
\]

So \( \frac{d\tilde{g}(k)}{dk} \) is the Fourier transform of \(-ik g(x)\).

Now if \( g(x) = 1 \) then \( \tilde{g}(k) = 2\pi \delta(k) \).
So \( 2\pi \delta(k) \) is the Fourier transform of \(-x\).

So the Fourier transform of \( g(x) = x \) is

\( \tilde{g}(k) = 2\pi i s'(k) \).