

The formula for the inverse Fourier transform shows that a function  $f(x)$  can be written in terms of its Fourier transform via

$$f(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} \tilde{f}(k) e^{ikx} dk \quad (1)$$

Take the derivative of both sides of this equation with respect to  $x$  and simplify. Interpret your expression as the inverse Fourier transform of something.