

## Fourier Transforms- HW Problems

In problems 1-3 find the Fourier transform of the given function.

$$\begin{aligned} 1. \quad f(x) &= 1 && \text{if } -2 \leq x \leq 2 \\ &= 0 && \text{if } x < -2 \text{ or } x > 2 \end{aligned}$$

$$2. \quad f(x) = \frac{1}{x^2+1}$$

$$3. \quad f(x) = \frac{1}{(x^2+1)^2}$$

In problems 4 and 5 find the inverse Fourier transform.

$$4. \quad g(k) = \frac{1}{1+k^2}$$

$$5. \quad g(k) = \frac{1}{(1+k^2)^2}$$