

Evaluate the following integrals

$$\int_{-\infty}^{\infty} \frac{x^2}{(1+x^2)^2} dx$$
$$\int_{-\infty}^{\infty} \frac{x^2}{(9+x^2)(x^2+4)} dx$$
$$\int_{-\infty}^{\infty} \frac{x^2}{(4+x^2)^2} dx$$
$$\int_{-\infty}^{\infty} \frac{\cos(x)}{1+x^2} dx$$
$$\int_{-\infty}^{\infty} \frac{1}{x^4+x^2+1} dx$$
$$\int_{-\infty}^{\infty} \frac{1}{x^4-x^2+1} dx$$
$$\int_{-\infty}^{\infty} \frac{1}{x^6+1} dx$$

Evaluate the Fourier transform of the functions:

$$f = \frac{1}{x^2+4}$$
$$f = \frac{1}{(z-2i)^2}$$
$$f = \frac{1}{(z-2i)(z+2i)}$$