

Hjälpmedel: Kurslitteratur, anteckningar och valfri räknare.

Telefon:

1. Determine the Fourier transform of the function $f(x) = \sin x \cos x$. (6 p)
2. Determine the Fourier transform of the 2-dimensional sequence $x_{00} = 1$, $x_{01} = x_{10} = 0$, $x_{11} = 2$ with period 2 in each coordinate. (6 p)
3. Let $f(x) = 1 - (x_1^2 + x_2^2)^{1/2}$ in the unit disk, and let $f(x) = 0$ elsewhere. Determine the Radon transform of f for $\theta = \pi/4$. (6 p)
4. Construct a function in $\mathcal{S}$ which vanishes outside a bounded interval, and which has non-negative Fourier transform. (7 p)