

Name:

ID:

Math 112C: Fun problems

1. For the functions of 1 variables, find the Fourier transform of

a)  $e^{-|x|}$

b)  $\frac{1}{1+x^2}$

2. For the functions of 2 variables, find the Fourier transform of

a)  $e^{-(x^2+y^2)/2}$

Can you generalize this to  $n$  dimensions?

3. Let  $u(x, y)$  be a function of 2 spatial variables, solve the following PDE using the Fourier transform.

$$u - \Delta u = e^{-(x^2+y^2)/2}$$