

MATH 464, HW 2

Define

$$T_a(f)(x) = f(x + a),$$

$$M_b(f)(x) = e^{-2\pi ibx} f(x),$$

$$D_c(f)(x) = \sqrt{c} f(cx).$$

1) Compute the Fourier transform of  $M_b(f)$  in terms of the Fourier transform of  $f$ , utilizing the above operations.

2) Compute the Fourier transform of  $D_c(f)$  in terms of the Fourier transform of  $f$ , utilizing the above operations.

3) Express the Fourier Transform of the following function  $ae^{2\pi iabx} f(ax - c)$ , in terms of the Fourier Transform of  $f$ . (Here  $a, b, c$  are positive constants.)

4) Express the Fourier Transform of the following function  $\sqrt{a}e^{-2\pi iabx} f(ax + c)$ , in terms of the Fourier Transform of  $f$ . (Here  $a, b, c$  are positive constants.)