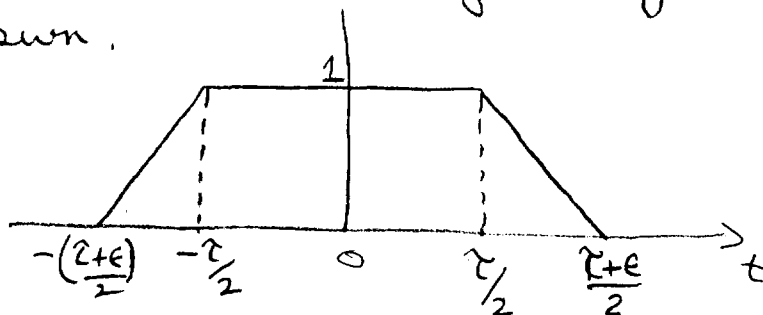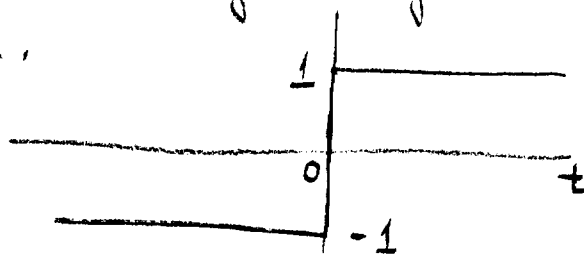6.1 (a) Calculate the Fourier Transform of the pulse shown.

(b) What is the Fourier Transform as $\epsilon \to \infty$

6.2 Calculate the Fourier Transform of the "sgn function" shown.

Hints:
First construct sgn(t):

$$sgn(t) = u(t) - u(-t)$$ where $u(t)$ is the unit step. Then find the F.T of $u(t)$ and construct the F.T. of sgn(t) from there.

6.3 The signals $s(t)$ and $g(t)$ are multiplied together and then passed through a linear system, $h(t)$. What is the Fourier Transform of the output signal $w(t)$?