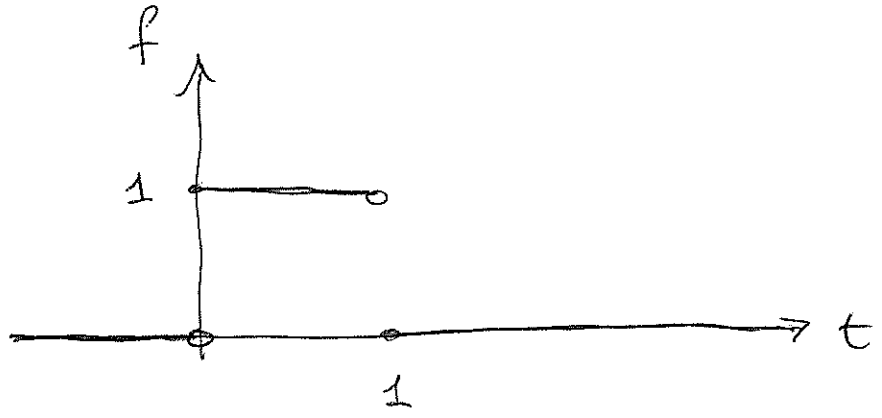
MATH 213

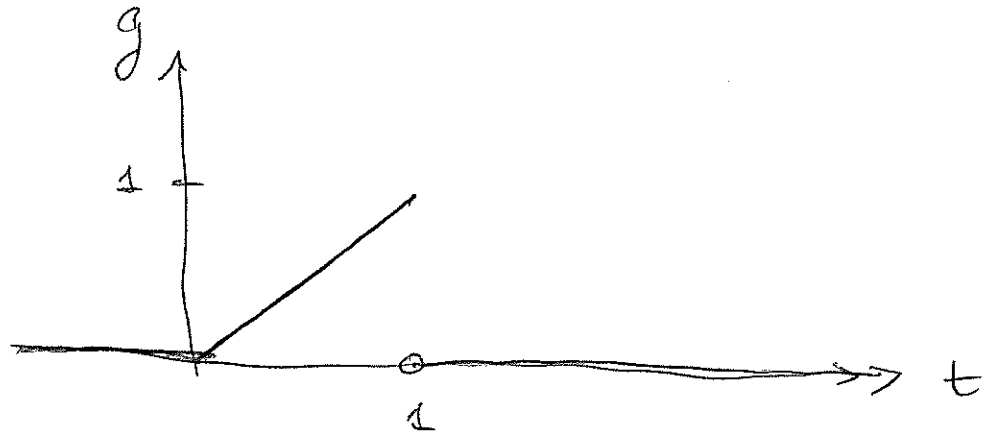
ASSIGNMENT NO. 4

Due 9 July

1. Let $f(t) = \begin{cases} 0, & t < 0 \\ 1, & 0 \le t \le 1 \\ 0, & t > 0 \end{cases}$:



and $g(t) = \begin{cases} 0, & t < 0, \\ t, & 0 \le t < 1 \\ 0, & t > 1 \end{cases}$



a) Directly calculate the convolution $(f * g)(t)$.

b) Compute $F(s)$ and $G(s)$ (using transforms that we've already computed, e.g. $\mathcal{L}\{u_{-1}(t)\}$, $\mathcal{L}\{t\,u_{-1}(t)\}$, and properties of the Laplace transform

c) Compute $\mathcal{L}\{(f*g)(t)\}$ in the same way.

d) Compare the results of b) and c).