Calculus 3 Assignment 1

BM Corser

1.

$$f(t) = \begin{cases} 5 & 0 \le t < 1 \\ t + 4 & 1 \le t < 2 \\ 4t - 2 & 2 \le t \end{cases}$$

(a) Where H is the unit step function

$$f(t) = 5 - 5H(t-1) + (t+4)H(t-1) - (t+4)H(t-2) + (4t-2)H(t-2)$$
$$= 5 + (t+4-5)H(t-1) + \Big((4t-2) - (t+4)\Big)H(t-2)$$
$$= 5 + (t-1)H(t-1) + (3t-6)H(t-2)$$
$$= 5 + H(t-1)(t-1) + 3H(t-2)(t-2)$$

(b)

$$\mathcal{L}\Big(f(t)\Big) =$$