

2704: Signals and Systems

Quiz #4

March 1, 2006

If $x_1(t) = \text{rect}(t)$, $x_2(t) = \text{rect}(t-1/2)$, $x_3(t) = x_1(t) + x_2(t)$, and $x_4(t) = \text{rect}(t)$ sketch the function $x_5(t) = x_3(t) * x_4(t)$.

SOLUTION:

$$\begin{aligned}x_5(t) &= x_3(t) * x_4(t) \\&= \{x_1(t) + x_2(t)\} * x_4(t) \\&= \left\{ \text{rect}(t) + \text{rect}\left(t - \frac{1}{2}\right) \right\} * \text{rect}(t) \\&= \text{tri}(t) + \text{tri}\left(t - \frac{1}{2}\right)\end{aligned}$$

This can be sketched as

