

MATH4564 - Homework No1 - Fall 03 - Konaté

Notice: Show your work. A right answer with a bad reasoning will be considered as wrong. Use a computer and any dialect to perform your graphing.

1• Write in terms of a unit step function a ($u_c(t)$) the given function:

$$f(t) = \begin{cases} t & \text{for } 0 < t < 5 \\ t + \sin(t) & \text{for } 5 < t < +\infty \end{cases}$$
$$g(t) = \begin{cases} t - \pi & \text{for } 0 < t < \pi \\ \pi^2 & \text{for } \pi < t < +\infty \end{cases}$$

2• Rewrite as a discontinuous function (I mean as f and g here above) the following functions and graph them on the given interval:

$$f_1(t) = t - (t - 1)u_1(t) \quad \text{over }]0, 3[$$

$$f_2(t) = (t - 3)u_2(t) - (t - 2)u_3(t) \quad \text{over }]0, 5[$$

$$f_3(t) = u_1(t) + 2u_3(t) - 6u_4(t) \quad \text{over }]0, 6[$$

$$f_4(t) = 2 \sin(t)u_2(t) - 5 \cos(t)u_1(t) + tu_3(t) \quad \text{over }]0, 6[$$

3• Consider:

$$f(x) = \begin{cases} x & \text{for } 0 < x < 1 \\ 2 - x & \text{for } 1 < x < 2 \end{cases}$$

Find the even extension $f_+(x)$, the odd extension $f_-(x)$ of $f(x)$. Plot $f(x)$, $f_+(x)$, $f_-(x)$ on the same graph in different colors
