

Problems Day 41, T 4/9/2024

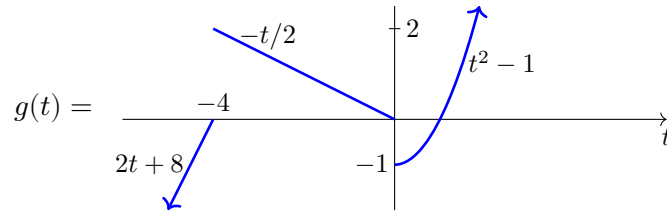
Topic 20: Delta functions (day 2)

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Problem 1. Compute $g'(t)$. Identify the regular and singular parts.

$$(a) \quad g(t) = \begin{cases} t & \text{for } t < 0 \\ t^2 + 1 & \text{for } 0 < t < 2 \\ 5 & \text{for } 2 < t < 4 \\ t^2 - 4t & \text{for } 4 < t \end{cases}$$

(b)



Problem 2. Solve $3x''' + 18x'' + 33x' + 18x = \delta(t-4)$, $\overbrace{x(0^-) = 0, x'(0^-) = 0, x''(0^-) = 0}^{\text{rest initial conditions}}$

Hint: characteristic roots are $-1, -2, -3$.

Get to the point of setting up equations for the coefficients c_1, c_2, c_3 , but don't solve for them.

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ES.1803 Differential Equations

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