MATH 583A

due November 29, 2018

Principles and Methods of Applied Mathematics

Section 001, Fall 2018 (instructor: Misha Stepanov)

Homework 6

The solution $x(t)$ is a convolution of $f(t)$ with the [Green's] function $G(t)$. Find and sketch $G(t)$.

1. $\dfrac{\mathrm{d}x}{\mathrm{d}t} + x = f(t)$

2. $\dfrac{\mathrm{d}^2x}{\mathrm{d}t^2} + \dfrac{\mathrm{d}x}{\mathrm{d}t} = f(t)$ (why $G'(t)$ is similar to $G(t)$ from **1.**?)

3. $-\dfrac{\mathrm{d}^2x}{\mathrm{d}t^2} + x = f(t)$

4. $\dfrac{\mathrm{d}^2x}{\mathrm{d}t^2} + 2\gamma\dfrac{\mathrm{d}x}{\mathrm{d}t} + x = f(t)$ (sketch $G(t)$ for small γ, for $\gamma = 1$, and for large γ (compare with **2.**))