

Worksheet 23

Sections 306 and 310
MATH 54

Nov 8, 2018

Exercise 1. Use variation of parameters to find a general solution for the following:

$$y'' + y = \sec(t)$$

Exercise 2. Use a combination of the law of superposition, undetermined coefficients, and variation of parameters to solve the following:

$$y'' + y = 3 \sec(t) - t^2 + 1$$

Note: You already did the variation of parameters part in exercise 1!
Why might someone want to use this method rather than just use only variation of parameters?

Exercise 3. Use the method of variation of parameters to show that:

$$y(t) = c_1 \cos(t) + c_2 \sin(t) + \int_0^t f(s) \sin(t-s) ds$$

is a general solution to the differential equation $y'' + y = f(t)$ where $f(t)$ is a continuous function. Hint: Use a trig identity for $\sin(t-s)$.