Math 218 — Assignment 2

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Due 2024/09/20

1. a) Give the general solution to the differential equation

$$y'' + 6y' + 13y = 0 \tag{1}$$

in terms of sin, cos, and exp with all coefficients real.

b) Give the general solution to (1) in terms of exp only and complex coefficients.

c) Express the free parameters of problem a) in terms of the free parameters of problem b).

d) Express the free parameters of problem b) in terms of the free parameters of problem a).

2. Give the general solution to

$$y'' + by' + cy = 0$$

with the initial condition $y(0) = y_0$.

3. a) Give the general solution to

$$y'' + 6y' + 13y = e^{\alpha x}$$

for $\alpha \in \mathbb{C}$ such that $\alpha^2 + 6\alpha + 13 \neq 0$.

b) Give the general solution to

$$y'' + 6y' + 13y = \sin(ax)$$

for $a \in \mathbb{R}$.