

Note: There will be no office hour on October 3

Practice

§3.2: 15,23,24,25

§3.3:1,3,4,5,6,11,13

Hand In

25) a) Determine a fundamental set of solutions for the differential equation

$$\frac{d^2y}{dt^2} - 6\frac{dy}{dt} + 8y = 0$$

b) Solve the initial value problem for $y(1) = 5$, $y'(1) = -2$

26) Determine which of the following pairs of functions are linearly independent:

a) $5x + 7$, $2x + 7$

b) $5x + 7$, $10x + 14$

c) $5x + 7$, $5x + 14$

d) e^x , e^{2x}

e) e^x , e^{x+1}

27) Show that the functions $y_1(t) = t^2$ and $y_2(t) = t^2 \ln(t)$ are a fundamental set of solutions for the differential equation

$$t^2 y'' - 3ty' + 4y = 0$$

28*) Sketch the following point sets in the complex plane, as well as their images under the exponential function:

a) $\{x + iy \in \mathbb{C} \mid x, y \in \mathbb{R}, |x - 4| < 2, |y| < 1\}$

b) $\{x + iy \in \mathbb{C} \mid x, y \in \mathbb{R}, x^2 + y^2 = 1\}$

c) $\{x + iy \in \mathbb{C} \mid x, y \in \mathbb{R}, y > 0\}$

d) $\{x + iy \in \mathbb{C} \mid x, y \in \mathbb{R}, x < 0\}$

29) Solve the initial value problem

$$4y'' - 20y' + 25y = 0, \quad y(-1) = 2, \quad y'(-1) = 3$$

Problems marked with a * are bonus problems for extra credit.