ENGR 2910-101: Circuit Analysis I

Instructor: Leo Silbert

Homework 1: 09/01/21

Due: 09/08/21

Example

In the following ordinary differential equation, solve for $y(x)$, subject to $y(x = 0) = y_0$, a constant:

$$\alpha y + \beta \frac{dy}{dx} = 0,$$

where, α and β are constants.

Question 1 [10]

If,

$$y^2 = 10x + 90 \sin^3 45,$$

what is the value of y at $x = 1.72$?

Question 2 [10]

What are the roots of: $x^2 + \alpha x + \frac{1}{\beta} = 0$?

Question 3 [10]

If, $y(x) = \beta x e^{-\alpha x}$, what is dy/dx?

Question 4 [10]

Evaluate the integral, $\int x e^{\alpha x} dx$.

Question 5 [10]

In the following ordinary differential equation, solve for $y(x)$, subject to $y(x = 0) = y_0$, a constant:

$$\alpha = \beta y + \gamma \frac{dy}{dx},$$

where, α, β, and γ are all constants.