

Class Discussion Activity 25

Exercises

- (1) Evaluate $\delta(t - 1) * t^2$ at $t = 2$.
- (2) Suppose $y(t)$ satisfies the integral equation $y(t) + \int_0^t y(x)(x - t) \, dx = 1$. Determine $y(1)$. Round to the nearest thousandth.
- (3) Suppose $y(t)$ satisfies the integral equation $y(t) + \int_0^t (t - x) y(x) \, dx = \delta(t - \pi)$. Find $y(4)$ to the nearest tenth.
- (4) Suppose $y(t)$ satisfies the integral equation $y(t) + 4 \int_0^t x^2 y(t - x) \, dx = 1$. Determine $y(1)$. Round to the nearest thousandth.
Hint: $s^3 + a^3 = (s + a)(s^2 - as + a^2)$.
- (5) Use Euler's method to estimate $y(0.6)$, where y is the unique solution to the IVP $y' = 1 - x^y$, $y(0) = 1$, using a step size of $\Delta x = 0.15$. Round your estimate to the nearest thousandth.