

Problem 8

In each of Problems 7 and 8, let $\phi_0(t) = 0$ and use the method of successive approximations to solve the given initial value problem.

- (a) Determine $\phi_n(t)$ for an arbitrary value of n .
- (b) Plot $\phi_n(t)$ for $n = 1, \dots, 4$. Observe whether the iterates appear to be converging.
- (c) Show that the sequence $\{\phi_n(t)\}$ converges.

$$y' = t^2y - t, \quad y(0) = 0$$