

Exercise 11

In Exercises 9–12, show that the given function $u(x)$ is a solution of the corresponding Fredholm integro-differential equation:

$$u''(x) = 1 - \sin x - \int_0^{\frac{\pi}{2}} tu(t) dt, \quad u(0) = 0, \quad u'(0) = 1, \quad u(x) = \sin x$$