

## SCHOOL OF NATURAL SCIENCES

## DEPARTMENT OF MATHEMATICS

## Quiz 2 (Integral Equations), Spring 2020

Date: March 05, 2020

 $\mathbf{AQ}$ . Find the solution y to the boundary value problem

$$\begin{cases} y'' = x^2, & x \in (0, 1), \\ y(0) = 0 = y(1), & \end{cases}$$

using the associated Green's function

$$G(x,s) = \begin{cases} s(x-1), & 0 \le s \le x, \\ x(s-1), & x \le s \le 1. \end{cases}$$

**RQ.** Solve the Volterra equation

$$u(x) = 1 + \int_0^x (x - t)u(t)dt,$$
 (a)

by finding the solution of the equivalent ODE.

"The capacity to learn is a gift; the ability to learn is a skill; the willingness to learn is a choice." — Brian Herbert.