Name: _____

Practice Test #01
Model #01

Fall 2022

Surname: _____

Date: September 20^{th}, 2022

- Each question has a value of 1 point.
- Each question is going to be binary checked (1 if it is correct, 0 otherwise; there are no decimal points).
- The practice has no grade.

Given the following IVP

$$\text{IVP}: \begin{cases} y'(x) = y^2 + x^2 y^2 \\ y(0) = -1 \end{cases}$$

solve it using the **Euler** method

$$y_{k+1} = y_k + \Delta x \cdot f(x_k, y_k)$$

for the interval $x \in [0, 1]$ for $n = 10$ space subdomains. Use that information to

1. **(1 pt)** complete the table,

Iteration k	Space Step x_k	Numerical Solution y_k	Analytical Solution $f(x_k)$	AVE $\lvert y_k - f(x_k)\rvert$
0	0	-1.0	-1.0	0.0
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

2. **(1 pt)** make a sketch of the numerical solution vs. the analytical solution, and
3. **(1 pt)** make a sketch of the error function.