Holy Spirit University of Kaslik
Faculty of Sciences
Department of Mathematics
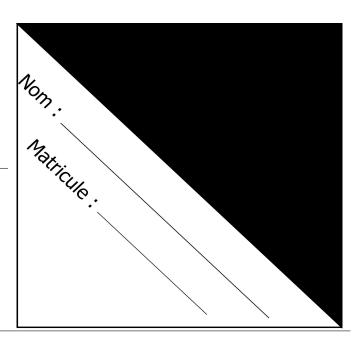
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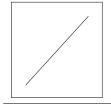|	
MAT418	**- Numerical Methods**
Spring	**- 2019/2020**
Assignment 1	**- April 08**
Duration:	**- 35 mn**

* Calculator non programmable is authorized

Instructor: Dr. Grace EL KHOURY

OBSERVATIONS :

Question 1 :

Our aim is to find the roots of $f(x) = x^2 - 2x + 0.51$.

For this reason we consider the function $x \rightarrow g(x) = \frac{1}{2}(x^2 + 0.51)$ and want to use the Fixed-Point Iteration on g.

1. Give the definition of a **fixed point** of a function $g(x)$.

2. Show that $x = 0.3$ is a fixed point of g.

3. Do you expect Fixed-Point Iteration to calculate the root 0.3, to some given correct decimal places, *faster or slower* than the Bisection method? Give an explanation.

4. Do 3 iterations of FPI starting from $x_0 = 0.1$ and find the exact and the approximated error at the third iteration.

5. Find the exact other fixed point. Will FPI converge to it? Justify your answer.