

| Student's Names | Student's IDs |
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| Question No. | I | II | III | Total |
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| Mark | | | | |

Instructions.

1. Work on this assignment as groups of two.
2. Use any trusted source of information to handle this assignment with proper citation and no plagiarism.

[I]

- (a) Use MATLAB to define and plot the function $f(x, y) = \sin(x + y^2) - \cos(y - x^2)$. Evaluate $f(0, \sqrt{\pi})$.
- (b) Draw the function $z = 3x^2 + y^2$ using MATLAB `mesh`, `surf` and `contour3` functions on $x = 1 : 0.1 : 3$, $y = 1 : 0.1 : 3$. Explain the difference between the figures.

[II]

- (a) Write a MATLAB function for Newton's Algorithm (Algorithm 2.3 in [1]).
- (b) Use the function in (a) to find the root of $e^x - 4x^2$ on $[4, 5]$ with accuracy 10^{-5} .

[III]

- (i) Use any Built-in MATLAB function to find the roots of $x^3 - 3x + 1$.
- (ii) What are the numerical techniques behind the function you used in (i).

[1] Numerical analysis, 9th Edition, Burden and Faires.