***Question1 (5 marks)***

Generate a Matlab program in a script file to perform the following tasks:

Given the (X, Y, and Z) points of a grid levelling task:

Plot the contour and surface maps of these points in one figure and if this area is a square with 25 m length calculate the average volume for cutting this area to 25 m level. (5 marks)

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***Question2 (5 marks)***

Generate a Matlab program in a script file to perform the following tasks:

Given the readings of a levelling task starting from a Bench Mark 100 m at the first point as following:

|  |  |  |
| --- | --- | --- |
| B.S | I.S | F.S |
| 4 | 0 | 0 |
| 3 | 0 | 3 |
| 0 | 2 | 0 |
| 0 | 1 | 0 |
| 0 | 2 | 0 |
| 0 | 2 | 0 |
| 2 | 0 | 3 |
| 0 | 0 | 3 |

Calculate the reduced levels of these points . (5 marks)

***Question3 (10 marks)***

Generate a Matlab program in a script file to perform the following tasks:

1. Given the angles of the traverse as following (99° 04' 22'' 102° 34' 56'' 90° 06' 03'' 18° 01' 58'' 231° 22' 50'' ) Check if these angles are correct or not and if not correct them

(5 marks)

1. Given the lengths of the traverse legs and the first point coordinates as following: Lengths = 285.1, 610.45, 720.18, 203, 647.02, and point 1 coordinates E=1000, N=1000

Check if the traverse error is within the allowable error or not (if its allowable balance the Travers with Bowditch rule) and if it's not print the following message (the observations should be repeated) (5 marks)

Best Wishes

Dr. Hassan Mohamed