**Question**

In the table below, total organic content (TOC) from 16 equally spaced wells is summarized. First column and row provide spatial data of the TOC.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **30** | 10 | 12 | 9 | 8 | | **20** | 20 | 17 | 10 | 7 | | **10** | 24 | 20 | 16 | 12 | | **0** | 32 | 28 | 12 | 18 | |  | **0** | **10** | **20** | **30** | |  |  |

Answer the following questions:

1. Calculate the variogram in the north-south direction at lag distance of 20 .
2. Calculate the variogram in the northeast-southwest direction at lag distance of .

**Solution**

From the equation of variogram provided in the notoes:

a) We can calculate in the north-south direction with 20 lag distance. The summation composes of 8 combinations. Plugging table values to the equation:

b) The variogram in northeast-southwest direction with ft lag distance composes of 4 combinations. Again from the same equation:

For the calculation of varipogram in this question, we do not need lag tolerance. That is because the data is uniformly spaced.