1167-51-291 **Derege H Mussa***, The University of Texas at Dallas 800 W. Camp, Richardson, TX 75080, and **Workineh Shewangizaw**, , Ethiopia. *25 partition types of Tetrahedra.* Preliminary report.

Tetrahedron (plural Tetrahedra) is a three-dimensional polyhedra having four vertices, four triangular faces and six edges which don't lie in a single plane. The labeling of the vertices and edges has been chosen to be in accord with the labeling used by J. Scott in describing a very elegant determinant that can be used for telling if there truly exists a tetrahedron with 6 given edge lengths . A six tuple S = (a, b, c, d, e, f) exists if the tetrahedron is facial and that the McCrea determinant is positive. we classify the tetrahedron according to the edges since the tetrahedron has six edges then there are 11 partitions. These 11 partitions classes all exist as 3D type but not as a degenerate 2D type because a 3D type may not exist in the plane. It is not difficult to see that there are tetrahedra for each of the 11 classes. The refined approach taking some geometric information (but not relative size of edges) into account leads to potentially 25 classes as was determined by D Mussa. Mussa's partition not only enumerates the refined number of partition classes but determines for each of these classes if there is an integer collection of lengths for a tetrahedron in this class exists. This paper discuses new partition types of tetrahedra and raised open questions. (Received March 09, 2021)