

Mesh Topology

A *surface mesh* consists of *vertices*, *edges* and *faces*.
The faces of a *triangle mesh* have three edges.
The faces of a *quad mesh* have four edges.
Every edge has two vertices.

Definition 1. The *Euler Characteristic* of a mesh is defined as

$$\chi = V - E + F \tag{1}$$

where V is the number of vertices, E is the number of edges and F is the number of faces.

Mesh Surfaces

type	orientable	connected	χ
Mobius strip	N	Y	0
Klein bottle	N	Y	0
projective plane	N	Y	1
disk	Y	Y	1
two disks	Y	N	2
sphere	Y	Y	2
two spheres	Y	N	4
torus	Y	Y	4
double torus	Y	N	-2