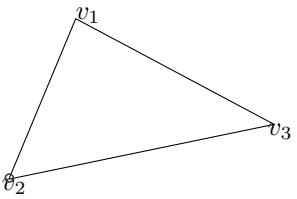
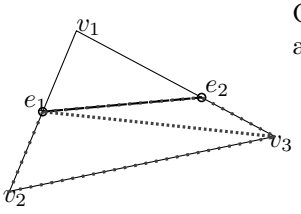
Classes

C_0



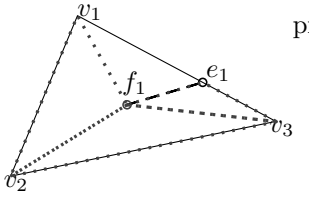
Split the point (if necessary); no adjacencies. Likely that its neighbors will be C_3, C_4 or C_5

C_1



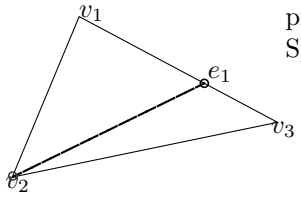
Create e_1 and e_2 if they don't alreay exist. Create the new triangles, and create edge $e_1 \to e_2$ (depending on sides of v_1)

C_2



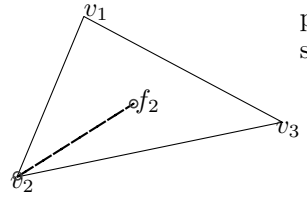
pre: v_1, v_2, v_3 not in split triangle. One face point and one edge point.

C_3



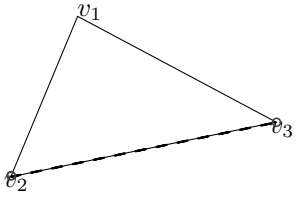
pre: One vertex on sep-tri. One edge point.
Split v_1 (if not already done)

C_4



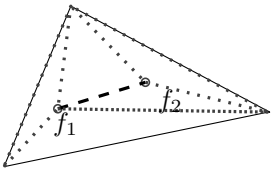
pre: one vertex on sep-tri. one face point.
split v_1 (if not already done). Similar to C_2

C_5



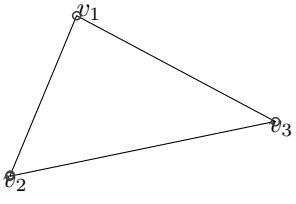
pre: two vertex on sep-tri.
split v_1, v_3 (if not already done).

C_6



pre: two face points (no edge points)
This is a troublesome case. In either case both side edges should lie within another tet (e.g., so the edges should eventually be split by an edge point if the edge corresponding to the closest face point is separating). On latter passes the these triangles should be either C_3, C_4, or C_5 (could be C_0 on non-splitting edge and same separating Δ).

C_{10}



Degenerate: all vertices on the triangle. If this is the case then assuming geomtery is manifold, nolthing needs to be done. split v_1, v_3 (if not already done).

Definitions

e: An edge point can only exist between two vertices that are not on the sep-tri.

f A face point (intersection of sep-tri edge) with the triangle cannot be within ϵ of a vertex. Cannot lie within ϵ of any edge point.

What about special cases when the face point lies on an edge? Preference to any particular case?

All edge points must be split. Face points may be split depending on whether they are on a separating edge.