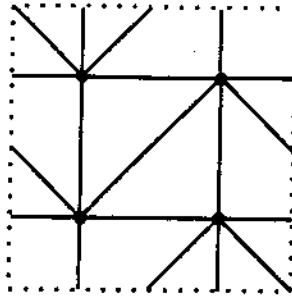
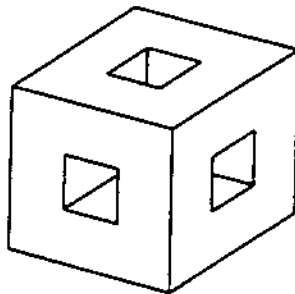


Math 364 Problem Sheet 8: Due Dec. 11

1. The following diagram shows a triangulation of the square model of the torus. Label the vertices, edges and faces. Use them to calculate the Euler characteristic of the torus.



2. Triangulate the standard octagon model of the 2-hole torus ( $T^2 \# T^2$ ) in any way you want. Use your triangulation to calculate the Euler characteristic.
3. Drill three holes in a cube, each connecting two opposite faces of the cube (see below). What is the genus of the surface of the resulting object?



Hint: Either try to deform the surface into something more familiar, or triangulate it and identify it by calculating its Euler characteristic.