1. Text 2.5. (Again) Present a (correct) triangulation, but **leave it to the reader to verify that it is a triangulation**. The reader will let you know if it is not correct. ⌣̈ Prove that is is minimal by a solely combinatorial argument; see the hint in the book. Before using the hint, you must justify it (briefly).

2. (Euler characteristic of planar models, take 2) Let P be a standard n-gon (with $n \geq 3$) (i.e. the polygon with vertices $\exp(i\theta_k)$ with $\theta_k = k/n$ for $k = 0, 1, \ldots, n-1$). Suppose we have a gluing scheme for the edges where each edge is glued to at most one other edge by means of an affine map. Let Q be the resulting quotient space, and let n_v and n_e be the number of vertices and edges respectively after identification.

a) Show by direct construction that Q can be triangulated.

b) Show that $\chi(Q) = n_v - n_e + 1$.

c) Compute the Euler characteristic of the torus, the Klein bottle, a sphere with 3 holes, the Möbius band, and a torus with a hole.

3. Identify the following surface: $\langle a, b, c : abacb^{-1}c^{-1} \rangle$.

a) Compute its Euler characteristic. (Use problem 2!)

b) Use cut/paste maneuvers to exhibit it as a connected sum of projective planes. Express your operations in terms of surface presentations.

4. People's choice. Go back an revisit any problem you received less than 6/10 (or equivalent) on. I'll upgrade your old assignment score, and you'll receive credit on the current assignment score, too.