Mathematics 3010, Summer 2009 Chapter 3 Problems

History

1. How are we able to date Euclid's life approximately?
2. What mistake did Euclid make in constructing an equilateral triangle?
3. What is the *golden ratio*?
4. Name a book other than the Elements authored by Euclid.
5. Who proved that there are only five regular convex polyhedra?
6. At least how long ago did humanity know about the dodecahedron?
7. Give two reasons that scholars believe there was no link between Greek and Babylonian mathematics.
8. What sort of geometric results were possibly passed from the Babylonians to the Greeks, if you don't believe the scholars from question 7?

Mathematics

1. Draw a picture that shows $(a-b)(a+b)=a^2+b^2$.
2. Use the Euclidean algorithm to find the gcd of 963 and 657.
3. From the definition of the golden ratio, compute its value.
4. Count the vertices, edges, and faces of a tetrahedron, and verify *Euler's formula* $V-E+F=2$.
5. Repeat problem 6 for the cube.
6. Repeat problem 6 for the octahedron.
7. Repeat problem 6 for the dodecahedron.
8. Repeat problem 6 for the icosahedron.