

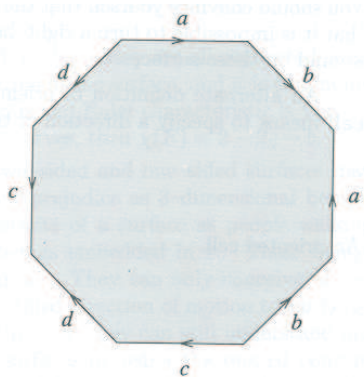
## Math 110 – Mathematical Explorations

Block 4 2005

### Individual Problems #5, due Wednesday, December 21

Please explain your solutions clearly, and provide justification for all your claims. You may consult your notes and the textbook, and you may use a calculator or computer algebra system if you like. You may not discuss these problems with any person other than me, and you may not consult other books. If you have questions, please come talk to me during my office hours, or at some other more convenient time for you.

1. With a series of carefully drawn pictures, fold the following identification diagram together (so that  $a$  matches  $a$ ,  $b$  matches  $b$ , etc.) to obtain a two-holed torus.



2. Prove that every knot with less than 3 crossings is the unknot.
3. Section 6.3: 37, 38

**Extra Credit:** Write a mathematical limerick.