Use regular sheets of paper, stapled together.
Don't forget to write your name on page 1.

1. (2 points) Give a complete list of the subgroups of $\mathbb{Z}_4 \times \mathbb{Z}_4$ which are isomorphic to $\mathbb{Z}_4$. There is no need to prove anything here, just write down the groups by listing all their elements explicitly. Hint: There is no need to use any theorems–this problem is entirely elementary. However, be advised that are more such subgroups than one might expect at first glance.

2. (2 points) For $n = 72$, give a unique representative of each isomorphism class of abelian groups of order n based on the Fundamental Theorem. Do the same based on the modified Fundamental Theorem as discussed in class. Indicated which isomorphism classes are the same under the two methods. Do the same for $n = 432$.

3. (2 points) Section 5.2, Problem 4(c)

4. (2 points) Section 5.5, Problem 1

5. (2 points) Section 5.5, Problem 2