Computations you need to be able to do.

1. Find $\gcd(a,b)$.

2. Find a linear combination of two integers adding to their gcd.

3. Add, subtract, and multiply mod m.

4. Multiply high powers mod m.

5. Find an inverse mod m.

6. Solve linear congruences.

7. Solve a system of congruences with different moduli.

8. Find the multiplicative order mod m of a number.

9. Find the number of classes invertible mod m.

10. Decompose a permutation into disjoint cycles.

11. Multiply two permutations using the cycle decomposition.

12. Find the order of a permutation.

13. Find the number of orbits of an action.

14. Decode a message encrypted with RSA.

15. Determine the number of bits of error that can be corrected for a linear code.

16. Create a list of error-correction vectors for a linear code.

17. Use a list of error-correction vectors to correct a binary transmission.

18. Decide when two 3-dimensional figures have the same symmetry.