

**Instructions**

- Answer each question completely; justify your answers.
  - This assignment is due at: 5:00 pm on Wednesday September 26th.
1. Exercise 1.10.
  2. Exercise 1.11, parts (b), and (f).
  3. Exercise 1.16, parts (a), and (b).
  4. Let  $a$ ,  $b$ , and  $c$  be integers such that  $a^2 + b^2 = c^2$ . Prove that at least one of  $a$  and  $b$  is even.
  5. Exercise 2.1.
  6. Exercise 2.3.
  7. Exercise 2.7.
  8. Exercise 2.11, parts (b), (c), and (d).
  9. Exercise 2.17.
  10. Define the sequence  $L_1, L_2, L_3, \dots$  by  $L_1 = 1$ ,  $L_2 = 3$ , and  $L_{n+2} = L_{n+1} + L_n \forall n \geq 1$ . In this sequence,  $L_n$  is called the  $n^{\text{th}}$  Lucas number. Prove that every two consecutive Lucas numbers are relatively prime.