

Proof by Cases

- Read carefully pages 89 through 93 (sections 3.4, 3.5)
- Some key questions to answer:
 1. Describe in detail how a “proof by cases” works.
 2. Provide an example of a *proof by cases*.
 3. Show that for two integers x, y , the integers have the same parity if and only if their sum is even.
 4. What is the meaning of the phrase “without loss of generality”? When do we use it in a mathematical proof?
 5. Prove that for two integers x, y , the product xy is even if and only if x is even or y is even.
 6. Study the mistakes in the proofs for problems 3.19 and 3.20 in section 3.5. Describe in words the lessons to be learned.
- Practice problems from section 3.4 (page 94): 3.30, 3.31, 3.34
- Practice problems from section 3.5 (page 95): 3.37, 3.38, 3.39, 3.40
- Challenge: 3.36