

Review Questions for Reading #1

Mathematical Proofs

1. What is a *mathematical proof*?
2. What is an *axiom*?
3. Give an example of an axiom.
4. What is a *theorem*?

5. What is a ***proof technique***?

6. Give an example of a proof technique.

7. Give another example of a proof technique.

8. Why are mathematical proofs important?

9. Describe at least five ***mistakes*** that you should watch for and avoid when writing mathematical proofs.

Mathematical Induction

10. What is the **standard form** of the **principle of mathematical induction**?

11. Describe the **structure** of a proof that uses the standard form of mathematical induction.
 - (a) What are you proving in the **basis**?

 - (b) What is the **inductive hypothesis**?

 - (c) What is the **inductive claim**?

 - (d) What, precisely, are you establishing in the **inductive step**?

12. What is the **strong form** of the **principle of mathematical induction**?

13. Describe the **structure** of a proof that uses the strong form of mathematical induction.

(a) What are you proving in the **basis**?

(b) What is the **inductive hypothesis**?

(c) What is the **inductive claim**?

(d) What, precisely, are you establishing in the **inductive step**?