MAT 243 Online Written Homework Assignments for Week 2 (units 4-5)

Free Response Questions

1. Formalize the following argument by introducing appropriate predicates and then rewriting the argument as a numbered sequence of statements. Identify each statement as either a premise, or a conclusion that follows according to a rule of inference from previous statements. In that case, state the rule of inference and refer by number to the previous statements that the rule of inference used.

   Every kid loves ice cream. Joey doesn't love ice cream. Therefore, Joey is not a kid.

2. Prove: the product of two odd numbers is odd.

3. Prove: there is a natural number that is greater than 2 and less than 10. (A *natural number* is a positive integer: 1,2, 3, etc.)

4. Prove: there is no natural number whose square is 10. (Producing a decimal approximation of $\sqrt{10}$ is not proof. You may use without proof that squaring an inequality between natural numbers preserves the inequality.)

5. Prove: Every even number can be written as the sum of two odd numbers.

6. Prove: for any two real numbers that are not equal, you can find a real number between them.