1. Use Euler circles to check the validity of the following argument.

   All calculators are useful tools.
   A hammer is a useful tool.
   Therefore, some hammers are calculators.

2. The Earth orbits the Sun at approximately 67,000 miles per hour. How far (in miles) will the Earth have traveled around the Sun in your lifetime (the average life expectancy is about 80 years)?

3. If a family has seven children, in how many different birth orders could the parents have a 2-boy, 5-girl family?

4. Let \( U = \{1,2,3,4,5,6,7,8,9,10\} \), \( A = \{1,3,5,7,9\} \), \( B = \{2,4,6,8,10\} \) and \( C = \{1,2,3,4,5\} \). List the members of each set. [1/2 pt each]

   a. \( A \cap B \)
   
   b. \( \overline{B} \cup C \)
   
   c. \( (A \cap C) \cup B \)
   
   d. True or false? \( A \leftrightarrow B \)
5. Use Venn diagrams to prove or disprove: \((A \cup B) \cap C = A \cup (B \cap C)\).

6. A survey of 300 middle school students about the ownership of cell phones, MP3 players and laptop computers revealed the following data. One-hundred-twelve students had a cell phone, 109 had MP3 players, and 60 owned a laptop. Forty students had both a cell phone and an MP3 player, 31 had an MP3 player and a laptop computer, 28 had a cell phone and a laptop, while 9 had all three. How many students did not own any of the three devices?

7. Construct a truth table for the compound statement: \([(p \land q) \lor \sim p] \to \sim q\).

8. Given the statement “If it builds a nest, then it is a bird,” Write the converse, inverse and contrapositive.

9. Negate the statement “All leaves are green.”