**1.** Construct a truth table for (p Λ q) → ~p. Be sure to include all intermediate steps in the table.

**3.** Construct a truth table for p ↔ (q V ~ p). Include all intermediate steps in the table.

**4.** Given p is true, q is true, and r is false, find the truth value of the statement ~q → (p V r).

**5.** Write the argument below in symbols to determine whether it is valid or invalid. State a reason for your conclusion. Specify the p and q used.

If the gazebo is made of wood, then the vine is growing on the gazebo.   
The vine is growing on the gazebo.

Therefore the gazebo is made of wood.

**6.** Determine which, if any, of the following three statements are equivalent and why.

I) Gasoline costs $1.99 per gallon if and only if you live in Orange County.  
II) You do not live in Orange County and gasoline does not cost $1.99 per gallon.  
III) If you do not live in Orange County then gasoline does not cost $1.99 per gallon.

**7.** Create a Euler diagram to determine whether the syllogism is valid or invalid.

All children like games.  
Eli is a child.

Therefore Eli likes games.

**8**. If the argument below is valid, name which of the four valid forms of argument is represented. If it is not valid, name the fallacy that is represented.  
   
If Sally is on vacation, then Tom is at work.  
If Tom is at work, then the line at the post office is long.   
Therefore, if Sally is on vacation, then the line at the post office is long.

**9.** If p is true, q is false, and r is true, find the truth value of the statement.

r → (~p↔~q)