2.4 Practice Questions: Truth tables

1. A truth table can determine whether or not a given deductive argument is formally valid. A truth table cannot determine whether or not the premises of such an argument are true or false.

2. A truth value is the property of a statement of being either true or false. All statements are either true or false. Sentences other than statements (such as commands and questions) do not have truth values.

3. The seven steps are:
   i.   Identify all of the simple statements in the argument.
   ii.   Starting at the left, create a column for each simple statement in the argument.
   iii. Add columns for each complex statement to the right of those columns.
   iv.   Label each premise and conclusion in the header row of your truth table.
   v.   Determine the number of rows your table will require.
   vi.   Enter the truth values in the cells in each column that represents a simple statement.
   vii. Enter the truth values in the cells in each column that represents a complex statement.

4. No, it is not possible for a truth table to have an odd number of rows (excluding the header row). This is because we determine the number of rows in the table with the calculation 2^n rows, where n equals the number of simple statements in the argument. 2 multiplied by any number results in an even number, which is why there cannot be an odd number of rows (excluding the header row).

5. Yes, a truth table may have an odd number of columns. The number of columns is determined by how many simple and complex statements are in the argument we are evaluating, and there is no rule concerning how many such statements an argument will contain.