SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Indicate whether the statement is a simple or a compound statement. If it is a compound statement, indicate whether it is a negation, conjunction, disjunction, conditional, or biconditional by using both the word and its appropriate symbol.

1) The animal is a mammal if and only if it nurses its young.

2) The clown is not amusing.

3) It is false that whales are fish and bats are birds.

Write a negation of the statement.

4) Some athletes are musicians.

5) All dinosaurs were carnivores.

Construct a truth table for the statement.

6) $(p \wedge \sim r) \wedge q$

Translate the statement into symbols then construct a truth table.

7) p = At most, 100 guests arrived at the wedding reception.
q = There was a lot of cake left over.
It is not the case that, at most, 100 guests arrived at the wedding reception and there was a lot of cake left over.

Let p represent a true statement, while q and r represent false statements. Find the truth value of the compound statement.

8) $\sim(p \wedge q) \wedge (r \vee \sim q)$

Construct a truth table for the statement.

9) $p \rightarrow \sim q$

10) $\sim[p \leftrightarrow (\sim q)]$

11) $\sim(p \wedge q) \rightarrow \sim(p \vee q)$

Determine whether the statement is a self–contradiction, an implication, a tautology (that is not also an implication), or none of these.

12) $p \rightarrow (q \vee p)$

13) $(q \wedge p) \leftrightarrow \sim(p \wedge q)$

Given p is true, q is true, and r is false, find the truth value of the statement.

14) $(q \vee r) \leftrightarrow (p \wedge q)$

15) $\sim[(\sim q \rightarrow r) \leftrightarrow (q \vee r)]$