Computer Science 2400
Fall 2021
Practice Quiz 2a
Formal Proofs

Circle either yes or no for each yes/no question.

1. Show a truth table for $((p \to q) \wedge (p \wedge q)) \to q$.

2. Is the following rule of inference valid? **yes no**

$$\frac{\begin{array}{l} p \to q \\ p \wedge q \end{array}}{q}$$

3. Is the following rule of inference valid? **yes no**

$$\frac{\begin{array}{l} p \vee q \\ p \end{array}}{\neg q}$$

4. Is the following rule of inference valid? **yes no**

$$\frac{(p \vee q) \to r}{(p \wedge q) \to r}$$

5. Is the following rule of inference valid? **yes no**
   (Hint. Remember that $p \to q$ is equivalent to $\neg p \vee q$.)

$$\frac{\begin{array}{l} \neg(p \to q) \\ \neg q \end{array}}{p}$$

6. Is the following inference valid? **yes no**

   Premises:

   The patient has high blood pressure or high cholesterol or both.
   The patient does not have high blood pressure or has diabetes or both.

   Conclusion:

   The patient has high cholesterol or diabetes or both.

7. Is the following inference valid? **yes no**

   Premises:

   Every student who stayed up too late missed the test.
   Juan is enrolled in the class.
   Juan did not miss the test.

   Conclusion:

   Some student did not stay up too late.

8. Is the following inference valid? **yes no**

   Premises:

   Every girl scout who sells at least 50 boxes of cookies gets a prize.
   Suzy is a girl scout.
   Suzy got a prize

   Conclusion:

   Suzy sold at least 50 boxes of cookies.