MTH 225: Discrete Structures 1 Asynchronous lesson activities: Module 4A

Directions: For each item below, give a complete response that represents a good-faith effort to be right. You will receive a "check" if each item has such a response, and an "x" otherwise. An "x" will be given if *any* item is left blank, shows insufficient effort, or has responses such as “I don’t know” or “I don’t understand”. Except for the final item (which is done by filling out a Google Form), do all work on separate pages, and submit a scanned black/white PDF **by email** to talbertr@gvsu.edu.

---

1. Use truth tables to show whether each of the following pairs of propositions is logically equivalent or not. On each, construct the appropriate truth tables and then clearly state whether the propositions are logically equivalent.

   (a) $q \wedge p$, $p \wedge q$

   (b) $p \wedge (q \vee r)$, $(p \wedge q) \vee (p \wedge r)$

   (c) $(p \to q) \wedge (p \to r)$, $p \to (q \wedge r)$

2. The Python function below takes two Boolean variables as input. How could you simplify line 2? Explain your reasoning.

```
def  foo(a,b):
    if a or (a and b):
        print("You win!")
    else:
        print("You lose!")
```

3. If you have questions about the content, please list them. (Otherwise this is optional.)