Student Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section Number \_\_\_\_\_\_\_\_\_

*This exam is printed on both sides of the paper. Be sure to answer all questions and pay attention to all instructions. In sample output, input provided by the user is underlined.*

Q1. **[28 pt.]** Compute the value of these 7 Python expressions assuming the following variable values.

x = [4, 5, 1, 2, 3]  
y = 8.0  
z = 5

|  |  |  |
| --- | --- | --- |
|  | **Expression** | **Expression Value** |
| a) | 3 in x |  |
| b) | Y \*\* 0 |  |
| c) | x[1]<x[2] |  |
| d) | not y in x |  |
| e) | x.index(5) |  |
| f) | y/2+z/4 |  |
| g) | z % 2 |  |

|  |
| --- |
| Q2 Sample Output |
| >>> contained()  **Enter list:[1,7,2]**  **False**  >>> contained() **Enter list:[1,3,7,8] True** |

Q2. **[20 pt.]** Write a Python function contained() that reads in a list of integers from the keyboard and returns **True** if every element in the list is both ≥ the first value in the list and ≤ the last value in the list. Otherwise the function must return **False**. **The output of your function must match the sample output exactly.**

|  |
| --- |
| Q3 Sample Output |
| >>> isSequence ([1,2,4,5])  **False**  >>> isSequence ([2,5,8]) **True** |

Q3. **[18 pt.]** Define a function isSequence(values) that returns **True** if the values list represents an arithmetic sequence or **False** if it is not. An arithmetic sequence is a sequence of numbers such that the difference between its consecutive numbers is constant. Assume that values has 3 or more numbers.

Q4. **[16 pt.]** The following code is intended count how many times a target value appears in a list.

**define** countTarget(values target):  
 for target in range(values):  
 if target in values:  
 count = count + 1  
 return count

**Circle four defects** **in the above code** and explain how you would fix them.

Q5. **[18 pt.]** You are given the code below:

x = **input**("enter a list [a, b, c, … ]:")  
other = []  
count = 0  
**for** val **in** x:  
 **if not** val **in** other:  
 other.append(val)  
 **else**:  
 count = count + 1  
**print** (count)

Assume you type [5,2,5,1,2] as input to the above program:

(a) What does the program print as output?

(b) What is the value of the variable **other** when the program completes?

(b) Construct a sample input list **of four elements** for which the program prints 0 (zero) as output