

Name: _____

Use this quiz to help make sure you understand the videos/reading. **Answer all questions.** Make additional notes as desired. **Not sure of an answer?** Ask your instructor to explain in class and revise as needed then.

Throughout, where you are asked to “circle your choice”, you can circle or underline it (whichever you prefer).

Textbook Reading: *Section 3.7 – Boolean Variables and Operators* (pages 106 - 109)

1. Suppose that **x** and **y** are variables whose values are numbers. Consider the following:

$$x < y$$

The value of the above expression might be: (circle **ALL** that are possible)

1 0 True False true false 'true' 'false'

2. Suppose that **x** and **y** are variables whose values are integers. Write a Boolean expression that you could use to test whether:

- a. Both of them are zero? _____
- b. At least one of them is zero? _____
- c. Exactly one of them is zero? _____
- d. Neither of them is zero? _____

Hint: The best answer to part (a) is: **(x == 0) and (y == 0)**
(The parentheses are optional here, since the **and** operator has higher “precedence” than the **==** operator.)

3. Suppose that **frozen** is a variable whose value is a Boolean value. Then the expression **not not frozen** evaluates to the same thing as the shorter expression: _____
4. What is the advantage of using the type **bool** (with possible values **True** and **False**) rather than **strings** **'False'** / **'True'** or **integers** **0** / **1**?

5. Suppose that the value of **b** is **False** and the value of **x** is **3**. For each of the following expressions, what is its value?

a. **b and (x == 3)** **True** **False** (underline your choice)

b. **b and (x == 4)** **True** **False** (underline your choice)

- | | | | | |
|----|-----------------------------|-------------|--------------|-------------------------|
| c. | b or (x == 3) | True | False | (underline your choice) |
| d. | b or (x == 4) | True | False | (underline your choice) |
| e. | (not b) and (x == 3) | True | False | (underline your choice) |
| f. | (not b) or (x == 3) | True | False | (underline your choice) |
| g. | b and (x != 3) | True | False | (underline your choice) |
| h. | b or (x != 3) | True | False | (underline your choice) |
| i. | b and (x != 4) | True | False | (underline your choice) |
| j. | b or (x != 4) | True | False | (underline your choice) |
| k. | (not b) and (x != 3) | True | False | (underline your choice) |
| l. | (not b) or (x != 3) | True | False | (underline your choice) |

6. Consider the compound statement shown to the right. Assume that **b** is a variable that contains a Boolean value and **n** is a variable that contains an integer value. Write a *simpler* (non-compound, single-line) statement that is *equivalent* to the statement shown to the right.

```

if n == 0:
    b = True
else:
    b = False
```

7. For each of the following expressions, what is its value? Assume x and y are arbitrary integers.

- | | | | | |
|----|---|-------------|--------------|---|
| a. | (1 + 2) == 3 | True | False | Difficult to say for sure
(underline your choice) |
| b. | (0.1 + 0.2) == 0.3 | True | False | Difficult to say for sure
(underline your choice) |
| c. | (math.sin(math.pi)) == 0 | True | False | Difficult to say for sure
(underline your choice) |
| d. | (1 / 10) + (9 / 10) == 1 | True | False | Difficult to say for sure
(underline your choice) |
| e. | (3 // 1) == (9 // 3) | True | False | Difficult to say for sure
(underline your choice) |
| f. | x > y or x <= y | True | False | Difficult to say for sure
(underline your choice) |
| g. | not(x > y and y > z) or x>z | True | False | Difficult to say for sure
(underline your choice) |