python basics – doe NOT include functions!!!

This is a *sample* of some of the things that you are responsible for – do not believe that if you know only the things on this test that they will get an A on any real test.

You must know everything that has been covered in lecture, in the text, in the online recitations and in the labs.

The purpose of this exercise to let you learn some of the things you do not know – so you can go out and learn them.

Note that this worksheet does not thoroughly test your problem-solving / programming ability but on the test you will required to write programs and/or short sections of code (code fragments)

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1. What is the purpose of variables?
2. State the rules for valid identifiers (what's an identifier)?
3. What are the 7 arithmetic operators? (symbols and names)
4. State the rules regarding the types of the operands with arithmetic operators (what's an operand?)
5. State the rules about the value and type of arithmetic expressions (what's an expression?) meaning what type is the result depending on the types of the operands
6. What is the type and value of `13 / 7` (or 13 // 7)? of `3 + 2 * 8` ?
7. What are precedence and associativity?
8. Round off the value that variable q refers to.
9. Multiply q by $\pi$ .
10. Define a variable that will refer to whether or not the user entered the number 5.
11. Write the word YES on the screen if the user did enter the number five – do this using your variable from the previous question.
12. What are the `bool` values?
13. Can numeric values coerce to `bool` values? (what's coercion? what's casting?) Give some examples of numeric to `bool` conversions.
14. List the six relational (comparison) operators)
15. Which of these six operators is a branching statement?
16. State the type rules for operands with the relational operators..
17. What is the type of an expression involving a relational operator?
18. What is the opposite of `<` ?
19. What is the type and value of `3 != 3` ?
20. List the logical (boolean) operators
21. State the type rules for operands to be used with the logical operators.
22. What is the type of an expression involving a logical operator?
23. What is the type of x in range( 5 )?
24. Is in a relational operator?
25. What is opposite of `in`?
26. What is the type and value of `( 3<4 ) || ( 3 >= 8 )`
27. If `r` and `t` are `floats`, is `r != t` always going to produce the result you might expect? Why?

28. What is short circuit evaluation?
29. What is precedence of `and or not`?
30. Consider the following with and without the parentheses: `((3<4)or(8!=8))and(9>=2)`
    When does the system stop evaluation subexpressions?
31. Why is `( 3 < 4 ) == True` dumb (besides testing literals)?
32. What is the value of `x = y` ?
33. What is the value range(3) ?
34. What are the possible values of `random.randint(3)` ?
35. What is the value `range(3,12,3)` ?
36. There are four main kinds of statements. We group them as follows:

- statements that happen once and are done
- statements that control the execution of other statements
  - looping
  - branching
- statements that cause execution to jump to another place in the program
- exceptions (which are not part of this course)

You must know the 8 problem formst for looping and branching.

A statement is kind of like an "activity unit" in the execution sequence.

Below are all the python statements we have covered so far along with some things that are not statements.
Identify which of the categories listed above each statement falls into.
For the looping and branching, state the problem forms each is a solution to
If it is not a statement, say so and explain.

variable definition
input statement
output statement
x + y
for
while
if
if else
if elif elif … else
if elif elif … elif
return _____
assignment statement (like `x = 3` or `y *= 7` or `z = m`)
else
elif
global const definition
type
scope
test (like `x <= 4` )

37. What type must the test be in any controlling statement? The test is the thing inside the ( ) in a controlling statement that is used to make the decision.
38. What are the three looping statements in python and when do you use each?
39. What are the branching statements in python and when do you use each?
40. Why is this code wrong?

```
if n < 4:
   print “blah blah\n”
if n > 4:
   print “other blah blah\n”
if n == 4:
   print “yet more blah blah\n”
```

41. Write the code that asks the user for their birthdate (an int like 27) and prints YES on the screen if their birthdate is the same as yours. Question: what is supposed to happen if their birthdate is not the same as yours? Question: would there be any constants? Question what is a code fragment? On the test if we ask you to write a code fragment or show you a code fragment, do you know what is meant?
42. To thoroughly test your code from the previous question, how many runs of the program would you need to do and what would be the values you need to input when pretending to be the user?
43. What is the output of this code?

NOTE: this is only a code fragment. If you say there is no output because there is not a complete program, you will have earned a ZERO for this question on a test. Assume the rest of the program is there and works. Note that you have no computer or any electronic devices of any sort – including calculators.

```
for q in range( 4 ):
   for s in range( q ):
     print str( q ) + " " + str( s )
```

44. What is the scope of variable q in the last question?
45. Describe or write the code for calculating an average of user inputs using the sentinel method
46. Describe or write the code for calculating an average of user inputs using the “ask how many” method where the user is asked how many inputs there will be.
47. Describe or write an input validation loop
48. What are all the uses of variables that you know at this point?
49. Last Question: What topics, before functions, was not covered in this review?