This worksheet is for your use during and after lecture. It will not be collected or graded, but I think you will find it a useful tool as you learn C++ and study for the exams. Explain all false answers for the "True or False" questions; in general, show enough work and provide enough explanation so that this sheet is a useful pre-exam review. I will be happy to review your answers with you during office-hours, via Email, or instant messaging.

1. All of our C++ programs will have a function named: A. `begin` B. `EntryPoint` C. `main` D. `WinMain`

   Solution: C

2. All C++ statements end with a(n): A. period B. semi-colon C. colon D. flourish

   Solution: B

3. (a) Write "`This is a comment`" as a comment in two different ways for C++.

   Solution: `/* This is a comment */` and `// This is a comment`.

   (b) Write the aforementioned comment across multiple lines in C++.

   Solution:

```
/* This                    // This
   is a                    // is a
   comment */              // comment
```

4. True or False: Indentation is required for the compiler to understand the logical structure of a C++ source listing.

   Solution: False. Indentation is to help humans visualize the structure of program logic.

5. True or False: Everything in a C++ source listing is translated to the computer program.

   Solution: False. Comments and indentation are ignored.

6. True or False: A computer program is the compiler and linker translation of *only* the program source listing.

   Solution: False. Pre-processor directives "import" code from system libraries.

7. Which of the following properties does a program variable possess?

   A. Size (in bits or bytes)

   B. Location (address in memory)

   C. URL (universal resource locator)

   D. Name

   E. Value

Solution: A, B, D, and E.

8. What is another term for the name given to a variable?

Solution: An identifier.

9. List three examples of valid C++ variable names.

Solution: `x3`, `SuperMan`, `mighty_mouse`

10. List two examples of **invalid** C++ variables names, and state why they are invalid.

Solution: `3x`: numerals cannot begin variable names. `CO2%`: The percent sign is an invalid character for variable names.

11. In the following table are four fundamental variables types in C++, list example values for each varible type.

`double`	`3.14`, `-1`, `0`, `32`
`int`	`-3`, `0`, `256`
`string`	`"c"`, `"word"`, or `"a phrase of several words"`
`bool`	`true`, `false`

12. Which of the fundamental variable types in 11 require(s) a pre-processor directive and a compiler directive? What are they?

Solution: The `string` type requires `#include <string>`, and `using namespace std;`.

13. Write two ways to declare a Boolean variable named `truth` as logical false.

Solution: `bool truth( false );` or `bool truth = false;`.

14. Write two ways to declare an integer variable named `N` with the value 3.

Solution: `int N( 3 );` or `int N = 3;`.

15. Write two ways to declare a constant real valued variable named `PI` as the value π.

Solution: `const double PI( acos(-1) );` or `double PI = acos(-1);`.

16. Assume the real valued variables `x`, `y`, and `z` are properly declared in a C++ program, complete the table by translating the mathematical expression to a C++ *statement*.

Mathematical Expression	C++ Statement
$x^2 + y - \frac{1}{z}$	`x*x + y - 1/z`
$\sqrt{3x - 4y} + \frac{x}{zy}$	`sqrt( 3*x - 4*y) + x/(z*y)`

17. (a) Write a C++ statement that prompts a user to enter a value for π.

Solution: `cout << "Enter␣a␣value␣for␣PI:␣<<␣endl;`

(b) Suppose your program has a variable named `user_pi` declared as a `double` variable type. Write a C++ statement that reads a value for `user_pi` from the keyboard.

Solution: `cin >> user_pi;`

(c) Now, write a C++ statment that prints `user_pi` to the console.

Solution:

```
cout << user_pi;
```