CS 180
Test 1 – 14 September 2018

Name _____

NO CALCULATORS ALLOWED

1. (5 pts) State what a variable is.

2. (8 pts) State what a data type is, and list the names of two C++ data types.

3. (6 pts) Circle all of the following that are *valid* C++ identifier names (do not consider style):

   loopVariable loop_variable loop-variable 4th_loop_variable unsigned Fred

4. (10 pts) Provide a full declaration (type and name) for a variable:

   (a) that will be used to store a count of the number of students in this class:

   (b) that will be used to store the combined sales tax rate for the city of Kirksville, which is currently 8.35%.

5. (12 pts) Given the following declarations:

```
double inside_temperature;
double outside_temperature;
```

write C++ code to prompt the user and then read values into these variables. Be very precise, and make it clear where the spaces are in your code. You do not need to write an entire program, just the statements to print the prompt and read in the values.

6. (12 pts) Write C++ code to calculate the difference between the two variables in problem 5 and print it to the screen using regular decimal notation with two digits to the right of the decimal point. Again, not a complete program, just the necessary statements, being clear where spaces are.

7. (12 pts) Given the initializations:

```
unsigned int number1 = 47;
unsigned int number2 = 10;
double number3 = 47.0;
double number4 = 10.0;
```

Show the exact value of each of the following expressions:

(a) `number1 / number2`

(b) `number3 / number4`

(c) `number1 % number2`

(d) `number3 + number4`

8. (5 pts) Suppose that `x` currently has the value 5 and `y` has the value 2. What is the value of `x` after the following statement executes?

```
x *= y + 2;
```

9. (15 pts) The formula for the surface area of a cube is $a = 6s^2$ where s is the length of a side. Write a well-written and well-styled C++ program that prompts the user for the measured length of a cube's side, reads that value in, and prints out the area of the cube rounded to the nearest hundredth of a unit. Use only techniques we have studied in class. Here is the beginning, and you write the rest:

```
// Calculate the surface area of a cube, given the length of a side
#include <iomanip>
#include <iostream>
using namespace std;
int main()
{
```