Name: _____

Solutions

1. (1 pt.)
   - ○ **Read all material carefully.**
   - ○ *If in doubt whether something is allowed, ask, don't assume.*
   - ○ You may refer to your books, papers, and notes during this test.
   - ○ E-books may be used *subject to the restrictions* noted in class.
   - ○ Computers are not permitted, except when used strictly as e-books.
   - ○ Network access of any kind (cell, voice, text, data, ...) is not permitted.
   - ○ Write, and draw, carefully. Ambiguous or cryptic answers receive zero credit.
   - ○ Use class and textbook conventions for notation, algorithmic options, etc.

   Write your name in the space provided above.

2. (4 pts.) What header file(s) must be included to enable each of the following C++ features to be used? Answer each part separately by providing the corresponding `#include` directive.

   (a) `round` Ⓐ*#include<cmath>*

   (b) `cin` Ⓐ*#include<iostream>*

   (c) `setwidth` Ⓐ*#include<iomanip>*

   (d) `rand` Ⓐ*#include<cstdlib>*

3. (5 pts.) Assuming surrounding code that makes the following code snippet valid, what value is stored in the variable `alpha` when the snippet is executed? Explain your answer briefly.

```
1    int alpha, beta = 42;
2    double gamma = 9.9;
3    alpha = beta * gamma;
```

Listing 1: Code snippet for Q. 3.

Ⓐ*The value stored in* `alpha` *is* 415. *The two floating point values are multiplied by the expression on the RHS of the assignment to give* $42 * 9.9 = 420 - 4.2 = 415.8$ *which gets truncated to* 415 *when assigned to the integer variable.*

4. (5 pts.) Should the following program compile as valid C++? Explain the reason for your answer. (There is zero credit otherwise.)

```
1    #include <iostream>
2    using namespace std;
3    int main() {
4      const int faveNum;
5      faveNum = 1729;
6      cout << faveNum << endl;
7      return 0;
8    }
```

Listing 2: Code for Q. 4.

(A) *No, it should give a compile-time error because it attempts to assign a value to a variable that has been defined as a* `const`, *which is not permitted.*

5. (15 pts.) Provide **well-formatted source code of a complete C++ program** that does the following:

- Reads from standard input a string (that may include whitespace) ending with a newline and stores it in an appropriately defined variable `uName`.

- Reads from standard input an integer and stores it in an appropriately defined variable `faveNum`.

- Writes the following to standard output, with `uName` and `faveNum` replaced by their values.

```
Hello, uName!
Why is it that your favorite number is favNum?
```

(A)

```
1      #include <string>
2      #include <iostream>
3
4      using namespace std;
5
6      int main() {
7        string uName;
8        int faveNum;
9        getline(cin, uName);
10       cin >> faveNum;
11       cout << "Hello, " << uName << "!" << endl
12         << "Why is it that your favorite number is " << faveNum << "?
             " << endl;
13       return 0;
14     }
```