A Review for Exam I

Problem 1
- Consider the C++ expression: $\frac{x}{y} \cdot \frac{z}{w} + \frac{n}{m} \% k$
  - Write an equivalent algebraic expression. When operations are on the same level use parentheses to eliminate possible misinterpretation.
  - Which of the six operations is done first?
  - Which of the six operations is done last?

Problem 2
- What will be the output of the following C++ code segment?
  ```cpp
  for(i=3; i<=6; i++){
    for(j=i; j>= 1; j--)
      cout << '*';
    cout << '\n';
  }
  ```

Problem 3
- What will be output by the following C++ code segment?
  ```cpp
  N=6;
  while(N-- > 3){
    for(i=1; i<= N; i++)
      cout << '*';
    cout << endl;
  }
  ```

Problem 4
- Consider the following code segment:
  ```cpp
  for(k=2; k<=N; k++)
    if(N%k==0){
      cout << k << endl;
      break;
    }
  ```
  - What will be printed if N is 49?
  - What will be printed if N is 31?
  - Now suppose the break; statement is removed.
    - What will be printed if N is 49?
    - What will be printed if N is 31?

Problem 5
- Tell whether or not the following identifiers are legal user-define identifiers. For any that is illegal, state what rule for naming identifiers is not followed.
  _the_Maximum
  9_of_spades
  Suit^4
  while
Problem 6

• Write a complete function called by random(a,b); that will return an integer in the range from a to b inclusive. Assume that a and b are positive integers and a < b.

Problem 7

• Write a program segment that will simulate the throw of two dice 10000 times and count the number of 7’s that occur.

Problem 8

• What will be printed by the following code segment?

```cpp
int A = 10;
int B = 20;
cout << A << "  " << B << endl;
foo(A,B);
cout << A << "  " << B << endl;
---------------
void foo(int &C, int D){
    C = C * 3;
    D = D * 3;
cout << C << "  " << D << endl;
return 0;
}
```

Problem 9

Write a C++ expression that will evaluate the algebraic equation.

\[ \frac{-b + \sqrt{b^2 - 4ac}}{2a} \]

Assume that all variables have been defined and that the variable a is not equal to zero. You may also assume that cmath has been included.

Problem 10

• Following is an if-else-if structure that uses the integer variable M.

```cpp
if(1 <= M && M <= 3)
    cout << "M is in Group 1" << endl;
else
    if(M < 6)
        cout << "M is in Group 2" << endl;
    else
        if(6 <= M && M <= 8)
            cout << "M is in Group 3" << endl;
        else
            cout << "M is an incorrect value." << endl;
```

For each of the following values of M indicate what would be printed.

• M = 0;
• M = 6;
• M = 7;

Write an equivalent switch statement that uses M to accomplish the same thing.