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Chapter 2

Pages 63

R2.1, 2, 3, 5, 6, 7, 8, 9, 13, 15, 16

Chapter 2 Written Homework

R2.1 What is the value of mystery after this sequence of statements?

```
int mystery = 1;
mystery = 1 - 2 * mystery;
mystery = mystery + 1;
mystery = 0
```

R2.2 What is wrong with the following sequence of statements?

```
int mystery = 1;
mystery = mystery + 1;
int mystery = 1 - 2 * mystery;
```

The third line is wrong. In the third line, mystery is not supposed to be set equal to itself.

R2.3 Write the following mathematical expressions in C++.

- s = s_0+v_0t+(0.5*g*(t*t))
- G = 4*(pow(pi,2))*((pow(a,3))/((pow(p,2)*(m1+m2)))
- FV = PV*(pow((1+(INT/100)),YRS))
- c = sqrt(pow(a,2)+pow(b,2)-(2*a*b*cos(γ)))

R2.5 What are the values of the following expressions? In each line, assume that

```
double x = 2.5;
double y = -1.5;
int m = 18;
int n = 4;
```

a. x + n * y - (x + n) * y
   6.25
b. m / n + m % n
   6
c. 5 * x - n / 5
   11.7
d. 1 - (1 - (1 - (1 - (1 - n))))
   -3
e. sqrt(sqrt(n))
   1.41421…

R2.6 What are the values of the following expressions? In each line, assume that

```
string s = "Hello";
string t = "World";
```

a. s.length() + t.length()
   10
b. s.substr(1, 2)
   “el”
c. s.substr(s.length() / 2, 1)
   “l”
d. s + t
   “HelloWorld”
e. t + s
   “WorldHello”

R2.7 Find at least five *compile-time* errors in the following program.

```
#include iostream
int main();
{
        cout << "Please enter two numbers:"
        cin << x, y;
        cout << "The sum of << x << "and" << y
        << "is: " x + y << endl;
        return;
}
```

1. Brackets around the iostream (#include <iostream>)
2. Missing semicolon on line 4
3. For cin, it is supposed to be >>
4. Missing the ” after “The sum of
5. Should return 0

R2.8 Find at least four run-time errors in the following program.

```
#include <iostream>
using namespace std;
int main()
{
        int total;
        int x1;
         cout << "Please enter a number:";
        cin >> x1;
        total = total + x1;
        cout << "Please enter another number:";
        int x2;
        cin >> x2;
        total = total + x1;
        double average = total / 2;
```

```
        cout << "The average of the two numbers is "
        << average << "endl";
        return 0;
}
```

1. Variables must be initialized to 0
2. In line 12, the program adds x1 to x1
3. In line 13, the average is the average of x1 and x1
4. In line 15, “endl” is in string format, causing it to be printed

R2.9 Explain the differences between 2, 2.0, "2", and "2.0".

2 is an integer, 2.0 is a double, “2” is a String, and “2.0” is a String as well.

R2.13 Write pseudocode for a program that computes the first and last digit of a number. For example, if the input is 23456, the program should print out 2 and 6. Hint: %, log10.

- Get the number using cin
    - Create a variable number, and then initialize it
    - Ex. cin >> number
- Declare a firstdigit and seconddigit variable, and initialize both to 0
- Set firstdigit to number
- Create a while loop, while firstdigit is >=10
    - Inside, set firstdigit to firstdigit/10
- Set lastdigit to number%10

R2.15 A cocktail shaker is composed of three cone sections. Using realistic values for the radii and heights, compute the total volume, using the formula given in Self Check 24 for a cone section. Then develop an algorithm that works for arbitrary dimensions.

Total value: 42.41 (r1 = 1.5, r2 = 0.75)

The algorithm would be the same, except to account for the curves.

R2.16 However, h is not so easy to measure, whereas the diameter d of a pie is usually well-known. Calculate the area where the diameter of the pie is 12 inches and the chord length of the segment is 10 inches. Gen eralize to an algorithm that yields the area for any diameter and chord length.

18.85 inches^2

$$h = \frac{d}{2} - \sqrt{(\left(\frac{d}{2}\right)^2 - (\frac{c}{2})^2)}$$