

Chapter 3

EXERCISE ANSWERS

Exam Preparation Exercises

1. a. Invalid b. Valid c. Invalid d. Valid e. Valid
2. a. 27 b. 13 c. 5 d. 0 e. 3 f. 8 g. 3
3. a. 3 b. 4 c. 37 d. 22 e. 23 f. 5
4. a. \(a = 5b = 2\) 
   b. Sum: 7
   c. Sum: 7
   d. 2 feet
5. a. file:///home/httpd/html/ec
6. A B
   413 is the value of n
   21.8 is the value of y
7. 8. a. .235294 b. 2.25 c. 44.2 d. 5 e. 0 f. 21 g. 8 h. 5 i. 1 j. 3

Exam Preparation Exercises

10. a. 9.1 b. 7.0 c. 24 d. 16.0 e. 5.0 f. 3.0

11. Below, denotes a blank.

ab
413 is the value of n
21.8 is the value of y
12. Below, denotes a blank.

a. \(x \text{ is} 14.38\)
   b. \(x \text{ is} 14.38\)
   c. \(x \text{ is} 14.38\)
   d. \(x \text{ is} 14.383\)

13. a. 26 b. reparation c. 0 d. 15 e. 15 f. 15

Programming Warm-up Exercises

3. Below, we use the minimum number of parentheses. Extra parentheses would be fine (as long as they are in the correct positions).

a. \(x / y - 3.0\) \(\leftarrow 3.0 \text{ could be 3}\)
   b. \((x + y) * (x - y)\)
   c. \(1.0 / (x + y)\) \(\leftarrow 1.0 \text{ could be 1}\)
   d. \(1.0 / x + y\) \(\leftarrow 1.0 \text{ could be 1}\)
   e. float(i) / float(j)
      \(\text{or}\)
      float(i) / j
      \(\text{or}\)
      i / float(j)
   f. \(i \div j\)
   g. \((x + y) / 3.0 - (x - y) / 5.0) / (4.0 \times x)\) \(\leftarrow \text{The literals could be 3, 5, 4}\)
4. a. \( \text{abs}(i) \)
b. \( \text{labs}(n) \)
c. \( \text{fabs}(x + y) \)
d. \( \text{fabs}(x) + \text{fabs}(y) \)
e. \( \text{pow}(x, 3.0) / y \) \( \text{or} \) \( x * x * x / y \)
f. \( \text{sqrt}(\text{pow}(x, 6.0) + \text{pow}(y, 5.0)) \)
g. \( \text{pow}(x + \text{sqrt}(y), 7.0) \)

6. This is a laboratory exercise for the student and requires no answer here.

7. This also is a laboratory exercise for the student, but it requires that comments be added before the program is entered. A sample is given here.

```cpp
#include <iostream>

using namespace std;

const int TOT_COST = 1376;   // Total cost
const int POUNDS = 10;       // Weight in pounds
const int OUNCES = 12;       // Additional weight in ounces

int main()
{
    int totOz;     // Total weight in ounces
    float uCost;   // Computed cost per ounce

    totOz = 16 * POUNDS;
    totOz = totOz + OUNCES;
    uCost = TOT_COST / totOz;
    cout << "Cost per unit: " << uCost << endl;
    return 0;
}
```

8. // Calculate perimeter

```cpp
perimeter = 2.0 * (length + width);
```

// Calculate area

```cpp
area = length * width;
```

// Output results

```cpp
cout << "Rectangle length = " << length
    << " and width = " << width << endl;
cout << "Rectangle perimeter is " << perimeter << endl;
cout << "Rectangle area is " << area << endl;
return 0;
```

10. Below, recall that if the second argument to `substr` is too large, it means “to the end of the string.”

```cpp
first = sentence.find("res");
tempStr = sentence.substr(first+3, sentence.length());
pos = tempStr.find("res");
second = first + 3 + pos;
tempStr = tempStr.substr(pos+3, tempStr.length());
```
pos = tempStr.find("res");
third = second + 3 + pos;
cout << "Second occurrence is in position " << second << endl;
cout << "Third occurrence is in position " << third << endl;

Case Study Follow-Up

3. To the constant declarations, add
   
   const float YELLOW_PRICE = 0.20;

To the variable declarations, add
   
   float yellowCost;

To the code for computing costs, add
   
   yellowCost = surfaceArea * YELLOW_PRICE;

To the output section, add
   
   cout << " yellow is" << setw(6) << yellowCost << " dollars" << endl;