Review Questions and Exercises

Short Answer

1. How many operands does each of the following types of operators require?
   1 Unary
   2 Binary
   3 Ternary
2. How may the double variables temp, weight, and age be defined in one statement?
   double temp, weight, age;
3. How may the int variables months, days, and years be defined in one statement, with months initialized to 2 and years initialized to 3?
4. Write assignment statements that perform the following operations with the variables a, b, and c:
   A) Adds 2 to a and stores the result in b.
   B) Multiplies b by 4 and stores the result in a.
   C) Divides a by 3.14 and stores the result in b.
   D) Subtracts 8 from b and stores the result in a.
   E) Stores the value 27 in a.
   F) Stores the character 'K' in c.
   G) Stores the ASCII code for 'B' in c.
5. Is the following comment written using single-line or multi-line comment symbols?
```
/* This program was written by M. A. Codewriter*/
```
6. Is the following comment written using single-line or multi-line comment symbols?
```
// This program was written by M. A. Codewriter
```
7. Modify the following program so it prints two blank lines between each line of text.
```
#include <iostream>
using namespace std;
int main()
{
    cout << "Two mandolins like creatures in the";
    cout << "dark";
    cout << "Creating the agony of ecstasy.";
    cout << "                    - George Barker";
    return 0;
}
```
8. What will the following programs print on the screen?
   A)
```
#include <iostream>
using namespace std;
int main()
{
    int freeze = 32, boil = 212;
```

Multiple Choice

9. Every complete statement ends with a(n) _____.
   A) period
   B) # symbol
   C) semicolon
   D) ending brace

10. Which of the following statements is correct?
    A) `#include (iostream)`
    B) `#include {iostream}`
    C) `#include <iostream>`
    D) `#include [iostream]`
    E) All of the above

11. Every C++ program must have a _____.
    A) `cout` statement
    B) function `main`
    C) `#include` statement
    D) All of the above

12. Preprocessor directives begin with _____.
    A) #
    B) !
    C) <
    D) *
    E) None of the above

13. The following data

    ```
    72
    'A'
    "Hello World"
    2.8712
    ```

    are all examples of _____.
    A) variables
    B) literals or constants
    C) strings
    D) none of the above

14. A group of statements, such as the contents of a function, is enclosed in _____.
    A) braces {}
    B) parentheses ()
    C) brackets <>
    D) all of the above will do

15. Which of the following are *not* valid assignment statements? (Select all that apply.)
    A) `total = 9;`
    B) `72 = amount;`
    C) `profit = 129`
    D) `letter = 'W';`

Review Questions and Exercises

Short Answer

1. Assume the following variables are defined:

```
int age;
double pay;
char section;
```

cin >> age >> pay >> section;

Write a single `cin` statement that will read input into each of these variables.

2. Assume a `string` object has been defined as follows:

```
string description;
```

A) Write a `cin` statement that reads in a one-word string. cin << description;

B) Write a statement that reads in a string that can contain multiple words separated by blanks. getline(cin, description);

3. What header files must be included in the following program?

```
int main() #include<iostream>
{
    double amount = 89.7;          #include <iomanip>
    cout << showpoint << fixed;
    cout << setw(8) << amount << endl;
    return 0;
}
```

4. Complete the following table by determining the value of each expression.

Expression	Value
`28 / 4 - 2`	5
`6 + 12 * 2 - 8`	22
`4 + 8 * 2`	20
`6 + 17 % 3 - 2`	6
`2 + 22 * (9 - 7)`	46
`(8 + 7) * 2`	30
`(16 + 7) % 2 - 1`	0
`12 / (10 - 6)`	3
`(19 - 3) * (2 + 2) / 4`	6

5. Write C++ expressions for the following algebraic expressions:

$a = 12x$ `a = 12 * x;`

$z = 5x + 14y + 6k$ `z = (5*x) + (14*y) + (6*k);`

$y = x^4$ `y = pow(x, 4);`

$g = \frac{h + 12}{4k}$ `g = (h+12) / (4*k);`

$c = \frac{a^3}{b^2k^4}$ `c = pow(a, 3)/(pow(b, 2) * pow(k, 4));`

6. Assume a program has the following variable definitions:

```
int units;
float mass;
double weight;
```

and the following statement:

```
weight = mass * units;
```

Which automatic data type conversion will take place?

A) `mass` is demoted to an `int`, `units` remains an `int`, and the result of `mass * units` is an `int`.

B) `units` is promoted to a `float`, `mass` remains a `float`, and the result of `mass * units` is a `float`.

C) `units` is promoted to a `float`, `mass` remains a `float`, and the result of `mass * units` is a `double`.

7. Assume a program has the following variable definitions:

```
int a, b = 2;
float c = 4.2;
```

and the following statement:

```
a = b * c;
```

What value will be stored in `a`?

A) 8.4

B) 8

C) 0

D) None of the above

8. Assume `qty` and `salesReps` are both integers. Use a type cast expression to rewrite the following statement so it will no longer perform integer division.

```
unitsEach = qty / salesReps;
```

unitsEach = static<double>(qty)/salesReps;

9. Rewrite the following variable definition so that the variable is a named constant.

```
int rate;
```

const int rate = 12;

10. Complete the following table by providing statements with combined assignment operators for the right-hand column. The statements should be equivalent to the statements in the left-hand column.

Statements with Assignment Operator	Statements with Combined Assignment Operator
`x = x + 5;`	
`total = total + subtotal;`	
`dist = dist / rep;`	
`ppl = ppl * period;`	
`inv = inv - shrinkage;`	
`num = num % 2;`	

11. Write a multiple assignment statement that can be used instead of the following group of assignment statements:

```
east = 1;
west = 1;
north = 1;
south = 1;
```

12. Write a cout statement so the variable `divSales` is displayed in a field of 8 spaces, in fixed-point notation, with a precision of 2 decimal places. The decimal point should always be displayed.

cout <<setw(12) 13. Write a cout statement so the variable `totalAge` is displayed in a field of 12 spaces, << fixed << setpresion in fixed-point notation, with a precision of 4 decimal places.
(4) << totalAge;

14. Write a cout statement so the variable `population` is displayed in a field of 12 spaces, left-justified, with a precision of 8 decimal places. The decimal point should always be displayed.

Fill-in-the-Blank

15. The _____ library function returns the cosine of an angle.
16. The _____ library function returns the sine of an angle.
17. The _____ library function returns the tangent of an angle.
18. The _____ library function returns the exponential function of a number.
19. The _____ library function returns the remainder of a floating-point division.
20. The _____ library function returns the natural logarithm of a number.
21. The _____ library function returns the base-10 logarithm of a number.
22. The _____ library function returns the value of a number raised to a power.
23. The _____ library function returns the square root of a number.
24. The _____ file must be included in a program that uses the mathematical functions.

Algorithm Workbench

25. A retail store grants its customers a maximum amount of credit. Each customer's available credit is his or her maximum amount of credit minus the amount of credit used. Write a pseudocode algorithm for a program that asks for a customer's maximum amount of credit and amount of credit used. The program should then display the customer's available credit.

    After you write the pseudocode algorithm, convert it to a complete C++ program.

26. Write a pseudocode algorithm for a program that calculates the total of a retail sale. The program should ask for the amount of the sale and the sales tax rate. The sales tax rate should be entered as a floating-point number. For example, if the sales tax rate is 6 percent, the user should enter 0.06. The program should display the amount of sales tax and the total of the sale.

    After you write the pseudocode algorithm, convert it to a complete C++ program.