Chapter 2
Answers to Self-Check Exercises

1. What manipulator inserts a new line character in the output stream?

Answer

endl
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2. Write a C++ statement that extracts an integer from the stream \texttt{cout} and places it in the object \texttt{Count}.

Answer

\texttt{cout >> Count;}
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3. Under what circumstances should function `main()` return a nonzero value?

Answer

Function `main()` should return a nonzero value.
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4. Write a C++ program that computes a tip on a meal purchase. Since you are generous, use 17 percent as the tipping rate.

Answer

```cpp
#include <iostream>
#include <string>
using namespace std;

int main() {
    // Input meal price
    cout << "Price of meal? ";
    float Price;
    cin >> Price;
    // Compute and output recommended tip
    cout << "Tip on $" << Price << " is ";
    cout << "$" << Price * 0.17 << endl;
    return 0;
}
```
5. Suppose a short is 16 bits on a particular machine. How big must an `int` be?

Answer

16 bits
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6. How many bits does the ASCII character set use to encode a character?

Answer
7. What type of C++ object is used to represent real numbers?

Answer

float
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8. What is the C++ escape sequence for including a newline in a string?

Answer

\n
9. What is the C++ escape sequence for include a double quote (""') in a string?

Answer

\"
11. Name the two numeric components of a floating-point number.

Answer

mantissa and exponent

Answer

$1.13 \times 10^{-10}$
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15. What are the allowable characters for forming valid a C++ name?

Answer

The allowable characters are letters (upper and lowercase), digits, and underscores.
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16. Is $\text{Window\$Cost}$ a valid C++ name?

Answer

No
17. In C++ a name that has a special meaning to the C++ compiler is called a ____________.

Answer

keyword
18. Write a C++ definition that defines and initializes the int object HeadCount to 25.

Answer

```cpp
int HeadCount = 25;
```
19. Write a C++ definition that defines and initializes the float object MovingAverage to 25.0.

Answer

```cpp
float MovingAverage = 25.0;
```
20. Using the notation <value, type> give the value of the C++ expression 23.0 + 8

Answer

<21.0, double>
21. Using the notation <value, type> give the value of the C++ expression 10 / 12.

Answer

<0, int>
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23. Using the notation <value, type> give the value of the C++ expression \( \frac{15}{14} \).

Answer

<1, int>
24. Using the notation <value, type> give the value of the C++ expression \(10L \div 2\).

Answer

\(<5, \text{long}>\)
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25. Using the notation <value, type> give the value of the C++ expression 25.5L / 5.

Answer

<5.1, long double>
26. Using the notation <value, type> give the value of the C++ expression 5 / 2.

Answer

<2, int>
27. Write a C++ program that converts U.S. dollars to Canadian dollars. Assume a conversion rate of 1.54 Canadian dollars for each U.S. dollar.

Answer

```cpp
#include <iostream>
#include <string>
using namespace std;

int main() {
    cout << "Enter U.S. dollar amount: ";
    float USDollars;
    cin >> USDollars;

    // Convert to Canadian dollars and output
    float CanadianDollars = USDollars * 1.54;
    cout << "$" << USDollars << " U.S. dollars is $" << CanadianDollars << " Canadian dollars." << endl;
    return 0;
}
```
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28. Using the notation <value, type> give the value of the C++ expression 2 + 5L.

Answer

<7, long>
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29. Using the notation <value, type> give the value of the C++ expression 2.3f + 5.2.

Answer

<7.5, double>
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30. Using the notation <value, type> give the value of the C++ expression 5.1f + 3L.

Answer

<8.1, float>
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31. Using the notation <value, type> give the value of the C++ expression 3.4L + 3L.

Answer

<6.4, long double>
32. Using the notation <value, type> give the value of the C++ expression 2 + 5L.

Answer

<7, long>
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33. Give the value of the C++ expression 3 / 2 + 5.

Answer
6
34. Give the value for the C++ expression \( 5 \div 1 + 2 \).

Answer

7
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35. Give the value of the C++ expression $3 \times 2 + 4 \times 5$.

Answer

26
36. Give the value of the C++ expression $4 - 2 + \frac{5}{3} + 2$.

Answer 5
37. Give the value of the C++ expression $10 - 2 + 7 \% 2 - 1$.

Answer

10
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38. Write a C++ statement that inserts the value of the expression 25 / 4 in the stream cout.

Answer

cout << 25 / 4 << endl;
39. What two files must be included in a C++ program to use the iostream library?

Answer

iostream and string
40. Write a C++ program that prompts for and accepts a time and computes the number of seconds elapsed since midnight. The time should be entered in the format HH:MM:SS.

Answer

```cpp
#include <iostream>
#include <string>
using namespace std;

int main() {
    cout << "Please enter a time (HH:MM:SS): ";
    int Hours;
    cin >> Hours;

    char Separator;
    cin >> Separator;

    int Minutes;
    cin >> Minutes;

    cin >> Separator;

    int Seconds;
    cin >> Seconds;

    int ElapsedTime = (Hours * 60 * 60) + (Minutes * 60) + Seconds;
    cout << "Elapsed time since midnight is " << ElapsedTime << " seconds." << endl;

    return 0;
}
```