C++ Programming Language Reference Sheet

Comments:

```
// This is a single-line comment
/* This is a
   multi-line comment */
```

Include Header Files:

```
#include <iostream> // Input/output stream
#include <string> // String handling
#include <vector> // Dynamic arrays
#include <cmath> // Mathematical functions
#include <cstdlib> // Standard library
```

Main Function:

```
int main()
{
    // Your code goes here
    return 0; // Program termination
}
```

Data Types:

- int: Integer
- float: Floating-point
- double: Double-precision floating-point
- char: Character
- bool: Boolean (true or false)
- string: String of characters
- vector: Dynamic array
- enum: Enumeration

Variables:

```
int age = 25; // Declaration and initialization
```

Input/Output:

```
std::cout << "Hello, World!" << std::endl; // Output
```

```
std::cin >> age; // Input
```

Operators:

- Arithmetic: +, -, *, /, %
- Comparison: ==, !=, <, >, <=, >=
- Logical: && (and), || (or), ! (not)
- Assignment: =, +=, -=, *=, /=
- Increment/Decrement: ++, --
- Ternary: (condition) ? true_expression : false_expression

Control Flow:

- if, else if, else: Conditional statements
- while: Loop
- for: Loop with initialization, condition, and increment
- switch: Multiway branching

Functions:

```
int add(int a, int b)
{
    return a + b;
}
```

Classes and Objects:

```
class Student
{
public:
    std::string name;
    int age;
};
```

Objects:

```
Student student1;
```

Arrays and Vectors:

```
int numbers[5]; // Array
std::vector<int> vec; // Vector
```

Pointers:

int* ptr; // Pointer declaration
ptr = &age; // Pointer assignment
*ptr = 30; // Dereferencing

Standard Libraries:

- iostream: Input and output
- string: String manipulation
- vector: Dynamic arrays
- cmath: Mathematical functions
- cstdlib: Standard library functions

Memory Allocation:

- new, delete: Dynamic memory allocation

Compile and Execute (g++):

$ g++ your_program.cpp -o your_program
$ ./your_program