1. Write a C++ program that prompts the user to input three integer values and find the greatest value of the three values.

   Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
    int n1, n2, n3;
    cout << "Enter the first number: ";
    cin >> n1;
    cout << "Enter the second number: ";
    cin >> n2;
    cout << "Enter the third number: ";
    cin >> n3;
    if (n1 > n2 && n1 > n3)
        cout << "First number is the greatest";
    else if (n2 > n1 && n2 > n3)
            cout << "Second number is the greatest";
    else
            cout << "Third number is the greatest";
    cout << endl;
    return 0;
}
```

   Output:

```
Enter the first number: 120
Enter the second number: 63
Enter the third number: 70
First number is the greatest
```

2. Write a C++ program to check whether a given number is even or odd.

   Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
    int num;
    cout << "Enter any number: ";
    cin >> num;

    if (num % 2)
     cout << "Number is odd!";
    else
            cout << "Number is even!";
    cout << endl;
    return 0;
}
```

   Output:

```
Enter any number: 40
Number is even!
```

3. Write a C++ program to check whether an alphabet entered by the user is a vowel or a consonant; using if else statement.

Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
    char ch;
    cout << "Enter any alphabet: ";
    cin >> ch;

    if (ch == 'A' || ch == 'a' || ch == 'E' || ch == 'e' || ch == 'I' ||
ch == 'i' || ch == 'O' || ch == 'o' ||
        ch == 'U' || ch == 'u')
        cout << "alphabet the vowel!";
    else
        cout << "Entered alphabet is consonant!";
    cout << endl;
    return 0;
}
```

Output:

```
Enter any alphabet: O
alphabet the vowel!
```

```
Enter any alphabet: M
Entered alphabet is consonant!
```

4. Write a program for checking if the character entered by the user is a lowercase letter or an uppercase letter. Once identified, your program should convert it into the corresponding letter in another category (i.e. 'e' should be converted to 'E' and vice versa). Make the console window intuitive. Attach outputs of both cases. Hint: Make use of the ASCII table.

Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
    char ch;
    cout << "Enter any alphabet: ";
    cin >> ch;

    if (ch >= 65 && ch <= 90)
    {
        cout << "Entered alphabet is upper case!";
        ch = ch + 32;
        cout << "\nEntered alphabet in lower case: " << ch;
    }
    else if (ch >= 97 && ch <= 122)
    {
        cout << "Entered alphabet is lower case!";
        ch = ch - 32;
```

```cpp
            cout << "\nEntered alphabet in upper case:" << ch;
        }
        else
        {
            cout << "Invalid input!";
        }
        cout << endl;
        return 0;
}
```

Output:

```
Enter any alphabet: z
Entered alphabet is lower case!
Entered alphabet in upper case:Z

Enter any alphabet: K
Entered alphabet is upper case!
Entered alphabet in lower case: k
```

5. Write a C program to read the temperature in centigrade and display a suitable message according to the temperature state below: Temp < 0 then Freezing weather Temp 0-10 then Very Cold weather Temp 10-20 then Cold weather Temp 20-30 then Normal in Temp Temp 30-40 then Its Hot Temp >=40 then It's Very Hot.
   Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
        int temp;
        cout << "Enter temperature(in centigrade): ";
        cin >> temp;

        if (temp < 0)
                cout << "Freezing Weather!";
        else if (temp >= 0 && temp < 10)
                cout << "Very Cold Weather!";
        else if (temp >= 10 && temp < 20)
                cout << "Cold Weather!";
        else if (temp >= 20 && temp < 30)
                cout << "Normal!";
        else if (temp >= 30 && temp < 40)
                cout << "Hot!";
        else
                cout << "Very Hot!";
        cout << endl;
        return 0;
}
```

Output:

```
Enter temperature(in centigrade): -33
Freezing Weather!

Enter temperature(in centigrade): 25
Normal!
```

6. Write a C++ program that determines a student's grade. The program will read three types of scores (quiz, mid-term, and final scores) and determine the grade based on the following rules:
   • if the average score is greater than and equal to 90%, the grade will be A.
   • if the average score is greater than and equal to 70% and less than 90%, the grade will be B.
   • if the average score is greater than and equal to 50% and less than 70%, the grade will be C.
   • if the average score is less than 50%, the grade will be F.
   Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
        float g_quiz, g_mid, g_final, sum, per;

        cout << "Enter the marks in Quiz: ";
        cin >> g_quiz;
        cout << "Enter the marks in Mid-Exam: ";
        cin >> g_mid;
        cout << "Enter the marks in Final: ";
        cin >> g_final;
        sum = g_quiz + g_mid + g_final;
        per = (sum / 300.0) * 100;

        if (per >= 90)
                cout << "You have got grade A!";
        else if (per >= 70 && per < 90)
                cout << "You have got grade B!";
        else if (per >= 50 && per < 70)
                cout << "You have got grade C!";
        else
                cout << "You have got grade F!";
        cout << endl;
        return 0;
}
```

Output:

```
Enter the marks in Quiz: 70
Enter the marks in Mid-Exam: 67
Enter the marks in Final: 93
You have got grade B!
```

7. Write a C++ Program to Check Whether a Number is Prime or Not.
   Code

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
        int num, c = 0, i = 2, temp;
        cout << "Enter any number: ";
        cin >> num;
        while (i <= num / 2)
        {
                temp = num % i;
                if (temp == 0)
                {
                        c++;
                }
                i++;
        }
        if(c == 0)
          cout << "Number is prime!";
        else
                cout << "Number is not prime!";
        cout << endl;
        return 0;
}
```

Output:

```
Enter any number: 63
Number is not prime!


Enter any number: 43
Number is prime!
```

8. Write a C++ program to find all roots of a quadratic equation.
   Code:

```cpp
#include <iostream>
#include<math.h>
using namespace std;

int main()
{
        float a, b, c, disc, r1, r2, real, img;
        cout << "Enter the co-efficient of x^2: ";
        cin >> a;
        cout << "Enter the co-efficient of x: ";
        cin >> b;
        cout << "Enter the constant term: ";
        cin >> c;
        disc = b * b - 4 * a * c;
        if (disc > 0)
        {
                r1 = (- b + sqrt(disc)) / (2 * a);
                r2 = (- b - sqrt(disc)) / (2 * a);
                cout << "First root of equation is: " << r1;
```

```cpp
            cout << "\nSecond root of equation is: " << r2;

        }
        else if (disc == 0)
        {
            r1 = - b / (2 * a);
            cout << "Root of equation is: " << r1;
        }
        else
        {
            real = -b / (2 * a);
            img = (sqrt(-disc)) / (2 * a);
            cout << "First root of equation is: " << real << "+i" << img;
            cout << "\nSecond root of equation is: " << real << "-i" <<
img;
        }
        cout << endl;
        return 0;
}
```

Output:

```
Enter the co-efficient of x^2: 8
Enter the co-efficient of x: 5
Enter the constant term: 4
First root of equation is: -0.3125+i0.634306
Second root of equation is: -0.3125-i0.634306
```

```
Enter the co-efficient of x^2: 1
Enter the co-efficient of x: 8
Enter the constant term: 3
First root of equation is: -0.394449
Second root of equation is: -7.60555
```