TP 4: Arithmetic and Logical Expressions

Exercise 1

Write a C++ program that asks the user for the variables and then calculates the expression:

a) $\frac{AB-C}{C+5.02D}$

b) $x = \frac{-b+\sqrt{b^2-4ac}}{2a}$

c) Y< X<Z

d) X=Y ou X=Z

e) |X-Y|

Exercise 2

Consider the function f(x) = $3x^3 + 2x^2 + 1$. Write an algorithm that reads any value x, then calculates and displays the value of f(x) for that input.

The output should be formatted as follows:

Enter the value of X : **4**

*F(4)= 3*****4*********4*********4****+2*****4*********4****+1=*

225

Exercise 3

Let's consider three students, Mohamed, Amine, and Moustafa, who have obtained the grades A, B, and C in their computer science exam. Write a C++ program that asks the user for the grades of these three students and then displays whether the following situations are verified or not for each of the following cases:

1) All students have passed their exams.
2) At least one student has passed the exam.
3) Only Amine has passed the exam.
4) Only one student has passed the exam.
5) Two students have passed the exam.
6) Amine and Mohamed have passed the exam and obtained the same grade.
7) Only Amine and Mohamed have passed the exam and obtained the same grade.
8) Mohammed has obtained the highest grade.
9) One of the students has obtained a grade of 15/20 or higher.
10) All three students have obtained the same grade.
11) The students have obtained different grades.

Note: To pass the exam, a grade must be strictly greater than 10.