

## 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)  $Y < X < Z$

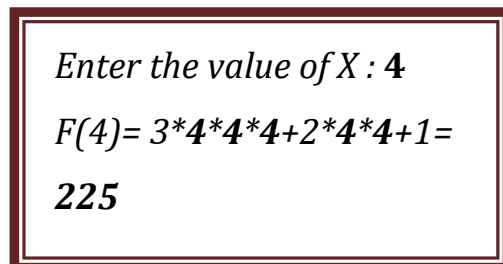
d)  $X=Y$  ou  $X=Z$

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.

