1. Data types. Arithmetic expressions. Input and output.

1.1

Write a program that reads a letter or other symbol from the keyboard and shows its ASCII code.

1.2

Write a program that reads 3 integer numbers from the keyboard and shows on the screen their mean value and the difference between each number and the mean value. The dialog with the user must be similar to the following:

```
Please, input 3 integer numbers
A ? 23
B ? 47
C ? 30
mean   = 33.333
A-mean = -10.333
B-mean = 13.667
C-mean = -3.333
```

Implement different versions of the program: using different types for the variables used to store **A**, **B**, **C** and **mean**. Interpret the results.

1.3

The mass of a sphere is given by the expression **M = 4/3(ρπr³)** where **M**, ρ and **r** are, respectively, the mass of the sphere, the specific mass of the material from which it is made, and its radius. Write a program that, given the values of ρ and **r**, determines the value of **M**. The user must be informed about the units used to represent all the values: Kg/m³, m and Kg for ρ, **r** and **M**, respectively. Use a constant to represent the value of π.

1.4

The solution to a system of linear equations in two variables (**x** e **y**)

a·x + b·y = c
d·x + e·y = f

is given by

x = (c·e - b·f) / (a·e - b·d)
y = (a·f - c·d) / (a·e - b·d)

Write a program that reads the values of **a**, **b**, **c**, **d**, **e** e **f** and determines the solution of the corresponding system of equations. Consider only the cases when there is a solution (it is not an impossible or inconsistent system).

1.5

a) Write a program that reads two times, expressed in hours, minutes and seconds, and determines their sum. The dialog with the user must be similar to the following:

```
Time1 (hours minutes seconds) ? 10 35 50
Time2 (hours minutes seconds) ? 15 59 30
Time1 + Time2  =  1 day, 2 hours, 35 minutes and 20 seconds
```

b) Modify the program so that the user must input a separator between hours, minutes and seconds (ex: 10:35:50). Although the separator usually used is '**:**', consider that any separator is valid.

1.6

The area of a triangle can be determined using the Heron's formula: $area = \sqrt{s(s-a)(s-b)(s-c)}$ where *s*, *a*, *b* and *c* are, respectively, the semi-perimeter and the length of the 3 sides. Write a program that reads the coordinates of the 3 vertices of a triangle and calculates the area of the triangle, using that formula. Remember that the distance between 2 points whose coordinates are (*x1*,*y1*) e (*x2*,*y2*) is given by $d = \sqrt{(x2-x1)^2 + (y2-y1)^2}$.