Assignment SU6 Instructions

Part 1

Write a program that can determine the **area**, **volume** and **diagonal** of a triangular prism that has a **base**, **perpendicular length** and **height** supplied by the user. Use the following formulas:

$$A = bl + lh + bh + h\sqrt{l^2 + b^2}$$

$$V = \frac{lbh}{2}$$

$$D = \sqrt{l^2 + w^2 + h^2}$$

The output for the input supplied, may look like this:

```
Cuboid calculator

Enter the base (cm): 20
Enter the length (cm): 15
Enter the height (cm): 12

Area of the triangular prism is 1020.0000 square cm
Space diagonal of the triangular prism is 27.731 cm
Volume of the triangular prism is 1800.00 cubic cm

**Triangular prism dimensions:**
base = 20.0 cm  length = 15.0 cm        height = 12.0 cm
```

1. Add your name, surname, and student number as a comment on the first line.
2. Add comments to your code that concisely explain what it does.
3. Save the file as "StudentNumber_SU6_1.py".

Note:

- The area calculation is rounded off to 4 decimals.
- The diagonal is rounded off to 3 decimals.
- The volume is rounded off to 2 decimals.
- The dimensions are displayed as floats with 1 decimal.

Hint:

- Make use of the math module.

Part 2

A quadratic equation has two roots being two values of x which satisfy the given equation. Write a Python program that calculates the two roots of a quadratic equation (**x1** and **x2**). Ask the user to supply the coefficients (**a**, **b**, and **c**) of a quadratic equation to calculate **x1** and **x2** using the following formulas:

$$x1 = \frac{-b+\sqrt{b^2-4ac}}{2a},\ x2 = \frac{-b-\sqrt{b^2-4ac}}{2a}$$

The output for the input supplied, may look like this:

```
Solving ax^2 + bx + c =0
Enter the value of a: 1
Enter the value of b: 5
Enter the value of c: 6

ROOTS OF GIVEN QUADRATIC EQUATIONS ARE:
x1: -2.0
x2: -3.0
```

1. Add your name, surname, and student number as a comment on the first line.
2. Add comments to your code that concisely explain what it does.
3. Save the file as “StudentNumber_SU6_2.py”.

Part 3

Ask the user to provide a character as input, then display the ASCII value of that character. Then ask the user to provide an ASCII value (int), then display the ASCII character that corresponds to that value.

The output for the input supplied, may look like this:

```
**ASCII and Character conversion**

Enter character: t
The ASCII value is:  116

Enter the ASCII value: 97
The Character is:  a
```

1. Add your name, surname, and student number as a comment on the first line.
2. Add comments to your code that concisely explain what it does.
3. Save the file as “StudentNumber_SU6_3.py”.

Upload and submit **the 3** files to eFundi.