

**Please do not write on the subject, and do not forget to hand it back at the end.**

## FUNCTIONS

### Question 1 :

The table shows the price of electricity in a neighbourhood of Newcastle.

Number of units used	100	200	300	500
Price (£)	8	11	14	20

Find the formula giving the price in terms of the number of units used ?

You are free to use any method of your choice to answer : a graph, computations...

### Question 2 :

Consider this experiment : we stand at the top of a cliff, and we drop a projectile.

We want to know the trajectory of the projectile : we start a stopwatch at the exact time of the throw, and we measure the vertical displacement each second after that.

We get the following table :

Time in s	Vertical displacement in m
0	0
1	- 4.9
2	- 19.6
3	- 44.1
4	- 78.4
5	- 122.5

We want to know what kind of function maps the time into the vertical displacement.

- Using graph paper, plot the vertical displacement against the time.  
You can round a bit the numbers.
- Draw a smooth curve between your points.  
What kind of curve do you get ?
- Then define the function mapping the time into the vertical displacement.
- The cliff is 313.60m high. After how many seconds will the projectile hit the ground ?

**Nota : cliff means « falaise »  
stopwatch means « chronomètre »**

**Graph paper for question 2 :**

