Question 1

Write a procedure that solves quadratic equations using the quadratic formula: It should take as arguments three numbers a, b, and c. It should print error messages if a is zero, or if the roots are complex. Otherwise it should print the two roots.

```
import math
a = int(input("enter a"))
b = int(input("enter b"))
c = int(input("enter c"))
d = b*b-4*a*c
x1 = (-b - math.sqrt(d))/(2*a)
x2 = (-b + math.sqrt(d))/(2*a)
if a == 0:
    print("error")
if(d<0):
    print("error, root are complex")
elif(d==0):
     print(x1 == -b/2*a)
else:
     print(x1)
     print(x2)
```

Question 2

Write a program that reads in a string on the command line and returns a table of the frequency of occurrence of each word. Ignore the case. A sample run of the program would look this Enter some letters >>> The cat in the hat
The - 2 Cat - 1 In - 1 Hat - 1
This should involve writing a function that takes in a string and returns a dictionary with these letters and counts.

```
myText = "the cat in the hat"
p = myText.count("the")
print("the",p)
q = myText.count("cat")
print("cat",q)
r = myText.count("in")
print("in",r)
s = myText.count("hat")
print("hat",s)
a = ["the", "cat","in","the","hat"]
print(a)
print(len(a))
```

Question 3

Write a program that accepts a sentence and calculate the number of letters and digits. Suppose the following input is supplied to the program: hello world! 123 Then, the output should be:
LETTERS 10
DIGITS 3

```
import re
a = input("enter a sentence")
x = re.findall("[a-z]",a)
print ("letter", len(x))
x = re.findall("\d",a)
print("digit",len(x))
```

Question 4

Write a Python program to check the validity of a password input by the user. The password should satisfy the following conditions:
a) It should have at least 1 letter [a to z]
b) It should have at least 1 number [0 to 9]
c) It should have at least 1 capital letter [A to Z]
d) It should have at least one special character [$, #, @]
e) Minimum length = 6 characters
f) Maximum length = 12 characters

```
p = input("enter password")
if len(p) < 6 or len(p) > 12:
    print("valid")
elif p.lower() and p.upper():
    print("valid")
elif p.isalpha() and p.isdigit():
    print("valid")
elif p in ['$', '#', '@']:
    print("valid")
else:
    print("invalid")
```

Question 5

Write a Python program that takes a string of words separated by spaces, together with a ”target” word, and shows the position of the target word in the string of words. For example, if the string is: ‘we dont need no education we dont need no thought control no we dont’ and the target word is ”dont”, then your program should return the list 1, 6, 13 because ”dont” appears at the 1st, 6th, and 13th position in the string. Your program should return False if the target word doesn’t appear in the string.

```
import re
g = "we dont need no education we dont need no thought control no we
     dont"
x = re.split(" ",g)
print(x)
o = x.index('dont')
print(o)
p = re.search('dont', g)
print(p)
z = re.findall("dont",g)
print(z.index('dont'))
if (o == "dont"):
    print("true")
else:
    print("false")
```