(20 Marks)

Q1 Create a function to reverse a number. Use this to create a function named differev that will return the difference of the reversed number from the original number (d=N-R). For example, for N=514 reversed number is 415 and the difference is 99.

Verify that differev(N) + rev(N) = N

(30 Marks)

Q2 Recall the week 3 problem, an Armstrong number is the one in which the sum of cubes of its digit is equal to the number itself.

Write a function which returns 1 if a given number is an Armstrong number, and 0 otherwise. Use this function to find the smallest Armstrong number, greater than a given number N. For example, if N=141 the next Armstrong number is 153.

Create another function that uses the above functions to print the series of first M Armstrong numbers. Test your program for M=4

Caution: Armstrong numbers are large numbers. Use suitable data types!

(50 Marks)

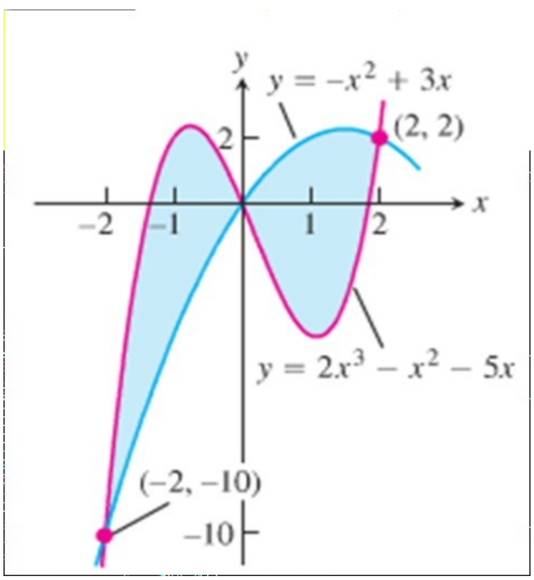
Q3 Assume that you are given two curves f and g defined as:

f(x) = -x^2 + 3x

and

g(x) = 2x^3 – x^2 – 5x

For your assistance, a diagrammatic representation of these curves is provided below.



Note that g(x) and f(x) intersect at (0,0).

In order to find the area bounded between these curves (shaded area), we find the approximation by summing the area of infinitesimally thin vertical strips that lie in between these curves.

Create a function to approximate the area bounded between the two curves using strips of width Δx (parameter to function) in the range [-2, 2].

Verify whether the following equality (approximately) holds true

Area[a,b] + Area[b,c] = Area [a, c]

where Area[x,y] is the area of the curve in the range [x,y]

Also, note the difference in areas with different width of strips.