

Numerical Integration - Variable Density

The total mass of a variable density rod is given by :

$$m = \int_0^L \rho(x) A_c(x) dx$$

Where m = mass , $\rho(x)$ = density , $A_c(x)$ = cross sectional Area ,
 x = distance along rod , L = length of rod.

Determine as accurately as possible the mass of the rod using Numerical Integration methods, as the length of rod changes from 0 to 10 m in the x direction.

x (m)	ρ (g/cm ³)	A_c (cm ²)
0	4.00	100
2	3.95	103
3	3.89	106
4	3.80	110
6	3.60	120
8	3.41	133
10	3.30	150