Solution 21.24

We can set up a table that contains the values comprising the integrand

x, cm	ρ, g/cm^3	A_c, cm^2	$\rho \times A_c$, g/cm
0	4	100	400
200	3.95	103	406.85
300	3.89	106	412.34
400	3.8	110	418
600	3.6	120	432
800	3.41	133	453.53
1000	3.3	150	495

We can integrate this data using a combination of the trapezoidal and Simpson's rules,

$$
I = (200-0)\frac{400+406.85}{2} + (400-200)\frac{406.85+4(412.34)+418}{6}
$$
$$
+ (1000-400)\frac{418+3(432+453.53)+495}{8} = 430,877.9 \text{ g} = 430.8779 \text{ kg}
$$