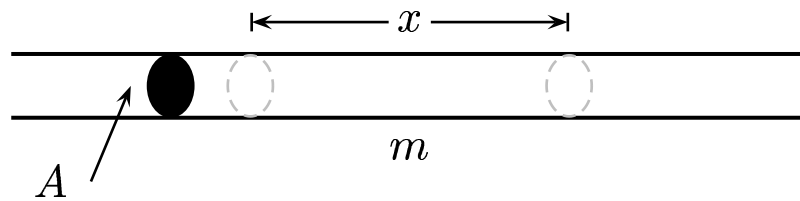


Consider a rope with uniform cross section.

Its density is $\rho = 1 \text{ kg/m}^3$.

Its cross section is $A = 0.1 \text{ m}^2$.



Find its linear mass density: $\mu = \frac{\text{mass}}{\text{length}} = \frac{m}{x}$ in terms of its density

and the cross section.

A) $\mu = \rho A$

B) $\mu = \frac{\rho}{A}$

C) $\mu = \frac{A}{\rho}$

$$[\mu] = \frac{M}{L} = [\rho^x A^y] = \left(\frac{M}{L^3}\right)^x (L^2)^y.$$

Equating powers of M and L leads to $1 = x$ and $-1 = -3x + 2y$.

Substituting $x = 1$ into the second equation gives $-1 = -3 + 2y$.

So, $y = 1$, or $\mu = \rho A$

Answer bf A.

01.04-02 A rope 2004-3-24