

**Question #76905, Physics / Classical Mechanics**

The force of capillarity in plant is given by  $F = prgh/2$  where  $r$  is the coefficient of surface tension. Is the equation correct or not. Justify the answer

Solution

$$F = \frac{prgh}{2}$$

Dimensions of the force are:

$$\dim F = MLT^{-2}.$$

$$\dim g = LT^{-2}$$

$$\dim h = L$$

$$\dim r = MT^{-2}.$$

$$\dim p = ML^{-1}T^{-2}.$$

Thus,

$$\dim\left(\frac{prgh}{2}\right) = LT^{-2}LMT^{-2}ML^{-1}T^{-2} = M^2LT^{-6} \neq MLT^{-2} = \dim F.$$

Therefore, the formula is not correct!

Answer provided by <https://www.AssignmentExpert.com>