Answer on Question #59306-Physics-Other

16cm3 of water flows per second through a capillary tube of radius a cm and of length l cm when connected to a pressure head of h cm of water. If a tube of same length and radius a/2 cm is connected to the same pressure head. The quantity of water flowing through the tube per second will be? and how?

Solution

The volume per second through a capillary tube of radius is

$$Q = \frac{\pi p a^4}{8\eta l} = 16\ cm^3$$

$$Q' = \frac{\pi p \left(\frac{a}{2}\right)^4}{8\eta l} = \frac{Q}{2^4} = \frac{16\ cm^3}{16} = 1\ cm^3.$$

Answer: $\mathbf{1\ cm^3}$.