Answer on Question #72538-Physics-Mechanics-Relativity

Water flows out of a pipe at the rate of 3.0 cm^3/s. Determine the velocity of the H2O at a point where its diameter is a) 0.50 cm & b) 0.80 cm

Solution

$$\frac{dV}{dt} = Av.$$

$$A = \frac{\pi d^2}{4}.$$

Thus,

$$\frac{dV}{dt} = \frac{\pi d^2}{4}v$$

a)

$$v = \frac{4}{\pi}\frac{3.0}{(0.50)^2} = 15\frac{cm}{s}.$$

b)

$$v = \frac{4}{\pi}\frac{3.0}{(0.80)^2} = 6.0\frac{cm}{s}.$$

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