85. One could reason as in §9-7 (with the thrust concept) or proceed with Eq. 10-8. Choosing the latter approach, we note that (with the final momentum being zero) the average force is (in magnitude)

$$F_{\text{avg}} = v\,\frac{\Delta m}{\Delta t}$$

where Δm is the portion of the water that is decelerated (by the wall) from speed $v = 500$ cm/s to zero during time Δt. If the impinging mass flow rate dm/dt is constant, then we conclude $dm/dt = \Delta m/\Delta t$. Thus, $F_{\text{avg}} = v\,dm/dt$. We are given the volume flow rate $dV/dt = 300\ \text{cm}^3/\text{s}$, and we use the concept of density to relate mass and volume: $m = \rho V$ where $\rho = 1.0\ \text{g/cm}^3$ for water (most students have seen density in previous courses). Thus,

$$F_{\text{avg}} = v\,\frac{dm}{dt} = \rho\,v\,\frac{dV}{dt} = (1.0)(500)(300)$$

which yields $F_{\text{avg}} = 1.5 \times 10^5\ \text{g}\cdot\text{cm/s}^2$ which we convert to SI, giving the result $F_{\text{avg}} = 1.5$ N.