Answer on question #51661, Physics, Mechanics — Kinematics — Dynamics

Question A stream of water flowing horizontally with a speed of 10m/s gushes out of a tube of crossectional area 10cm2 and hits a vertical wall nearby the force extracted the wall by impact of water (assume it rebounded) 1) 500N. 2) 20N. 3) 100N.) 200N

Solution basic assumptions are:
Dynamic pressure can be found as

$$p = \frac{\rho v^2}{2}$$

where $\rho = 1000 kg/m^3$ is density and $v = 10 m/s$ is velocity. To find force we have to multiply it by area $S = 0.001 m^3$. And to take into account that stream is rebounded, we have to multiply whole thing by 2. Hence,

$$F = 2 \cdot S \cdot \frac{\rho v^2}{2} = 2 \cdot 0.001 \cdot \frac{1000 \cdot 10^2}{2} = 100\, N$$

Answer is 3. 100N.