Answer on Question 49188, Physics, Mechanics — Kinematics — Dynamics   Water flows through a 4 cm diameter garden hose at a velocity of 2 m/s. What is the velocity of the water if a nozzle is used with a diameter of 0.5 cm?

Solution

From equation of continuity

$$v_1 S_1 = v_2 S_2$$

$$v_2 = v_1 \frac{S_1}{S_2} = v_1 \frac{d_1^2}{d_2^2} = 2 \cdot \frac{4^2}{0.5^2} = 2 \cdot 64 = 128 \, m/s$$