
Example

A hose discharges water at a rate of $\dot{V} = 2000$ gal/min with a speed of $V_0 = 100$ ft/s from the stern of a fireboat. The stream is used to extinguish a building fire on shore. Water is drawn into the boat vertically from the river with negligible velocity. In order to keep the boat stationary in the water, Iggy the Giant Firefighter Squid pushes on the boat as shown in the figure

- (a) Determine the horizontal component of the force Iggy must exert in order to keep the fireboat stationary position. ($1 \text{ ft}^3 = 7.48$ gal)
- (b) At what angle should the hose be set? (Hint: Pick a closed system consisting of a water droplet and follow it as it travels to the building.)

