QUIZ 8

3. **[10 points]** A gardener uses a water hose 4.0 cm in diameter to fill a 20.0-L bucket. The gardener notes that it takes 1.00 min to fill the bucket. A nozzle with an opening of cross-sectional area 1.0 cm^2 is then attached to the hose. The nozzle is held so that water is projected horizontally from a point 1.00 m above the ground. Over what horizontal distance can the water be projected? (g=10 m/s^2)

$$20/_{60} = 0.33$$

$$A_1 V_1 = A_2 V_2$$

$$(12.566)(0.33) = V_2 = 4.188 \, m/s$$

$$1 = \frac{1}{2}(10)t^2 \qquad t = \sqrt{\frac{1}{5}} = 0.447$$

$$\Delta x = 4.188(.447) = \boxed{1.873 \, m}$$