

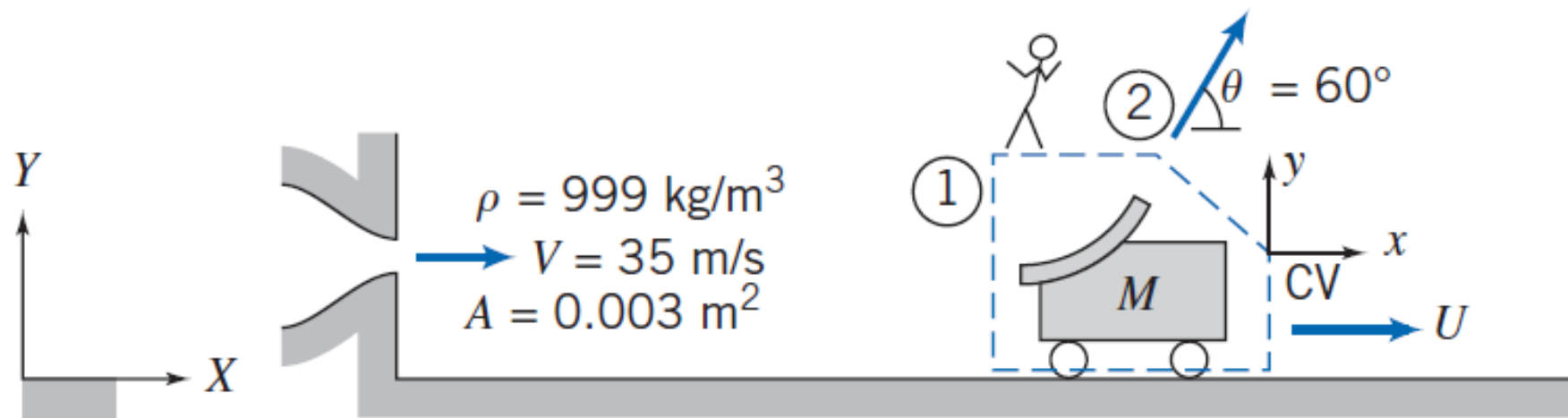
Exercícios VC

Parte 3

A vane, with turning angle $\theta = 60^\circ$, is attached to a cart. The cart and vane, of mass $M = 75 \text{ kg}$, roll on a level track. Friction and air resistance may be neglected. The vane receives a jet of water, which leaves a stationary nozzle horizontally at $V = 35 \text{ m/s}$. The nozzle exit area is $A = 0.003 \text{ m}^2$. Determine the velocity of the cart as a function of time and plot the results.

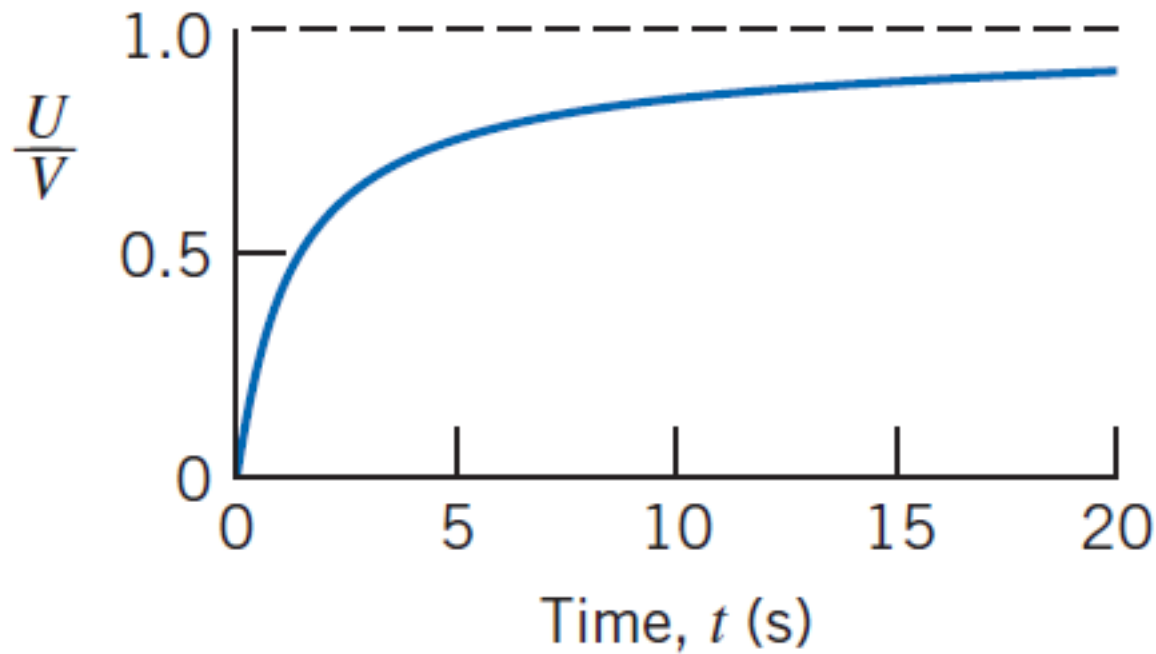
Para o carrinho do diagrama abaixo, pede-se:

- A aceleração do carrinho.
- Tente encontrar uma expressão para a velocidade do carrinho em função do tempo.

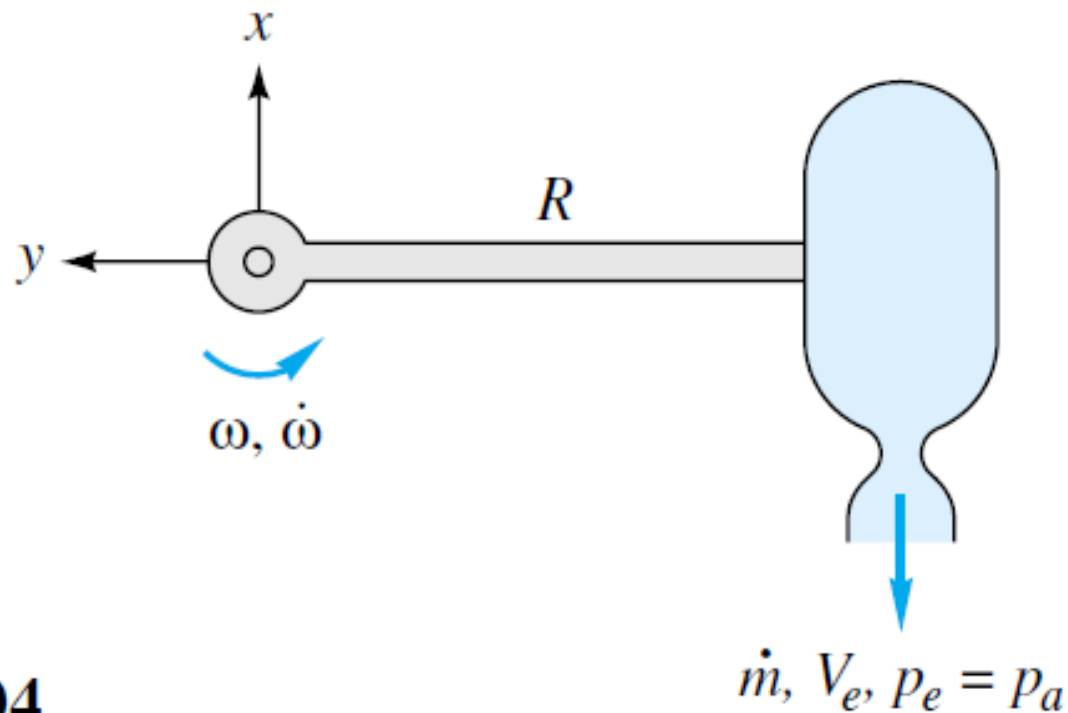


$$\frac{U}{V} = \frac{Vbt}{1 + Vbt}$$

$$\text{where } b = \frac{(1 - \cos\theta)\rho A}{M}$$



A rocket is attached to a rigid horizontal rod hinged at the origin as in Fig. P3.104. Its initial mass is M_0 , and its exit properties are \dot{m} and V_e relative to the rocket. Set up the differential equation for rocket motion, and solve for the angular velocity $\omega(t)$ of the rod. Neglect gravity, air drag, and the rod mass.



P3.104