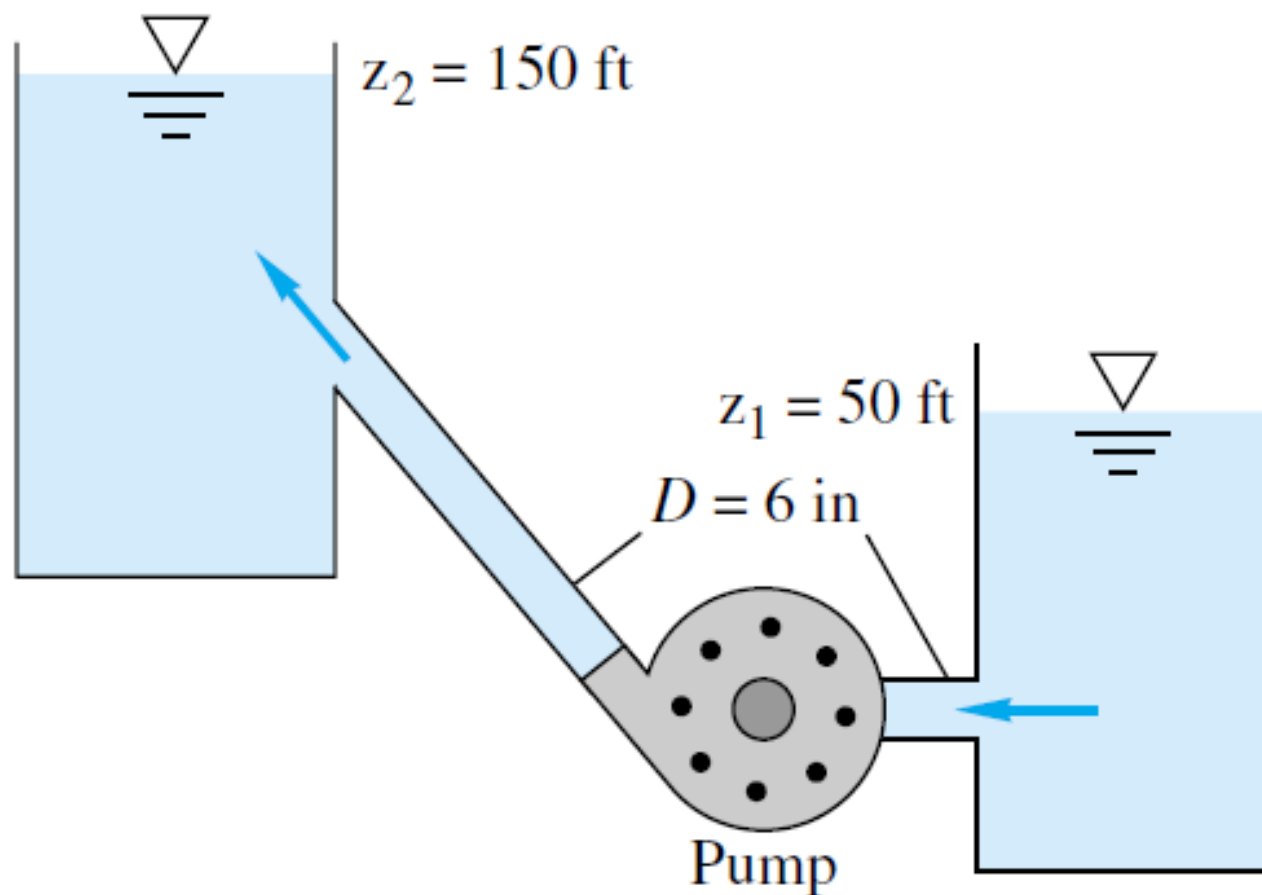


Exercícios VC

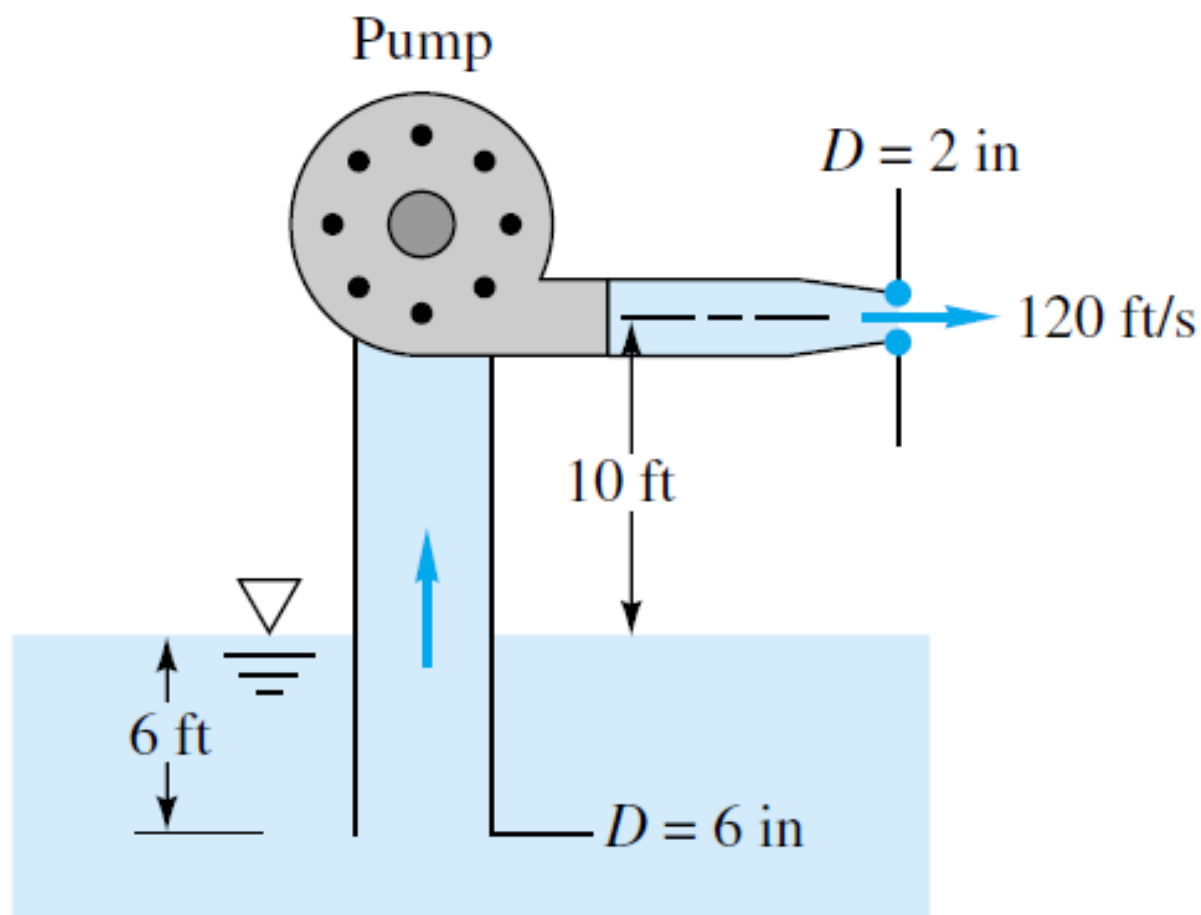
Parte 5

Water at 20°C is pumped at 1500 gal/min from the lower to the upper reservoir, as in Fig. P3.141. Pipe friction losses are approximated by $h_f \approx 27V^2/(2g)$, where V is the average velocity in the pipe. If the pump is 75 percent efficient, what horsepower is needed to drive it?

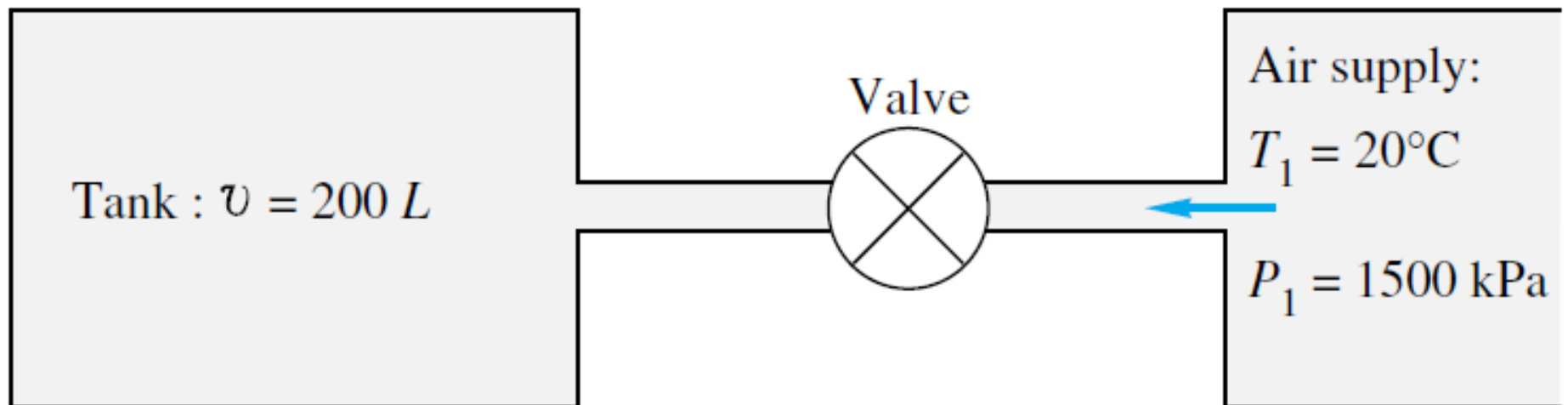


P3.141

A fireboat draws seawater ($SG = 1.025$) from a submerged pipe and discharges it through a nozzle, as in Fig. P3.137. The total head loss is 6.5 ft. If the pump efficiency is 75 percent, what horsepower motor is required to drive it?



The insulated tank in Fig. P3.143 is to be filled from a high-pressure air supply. Initial conditions in the tank are $T = 20^\circ\text{C}$ and $p = 200\text{ kPa}$. When the valve is opened, the initial mass flow rate into the tank is 0.013 kg/s . Assuming an ideal gas, estimate the initial rate of temperature rise of the air in the tank.



P3.143