

72. We rewrite the formula for work  $W$  (when the force is constant in a direction parallel to the displacement  $d$ ) in terms of pressure:

$$W = Fd = \left(\frac{F}{A}\right)(Ad) = pV$$

where  $V$  is the volume of the water being forced through, and  $p$  is to be interpreted as the pressure difference between the two ends of the pipe. Thus,

$$W = (1.01 \times 10^5 \text{ Pa})(1.4 \text{ m}^3) = 1.5 \times 10^5 \text{ J} .$$