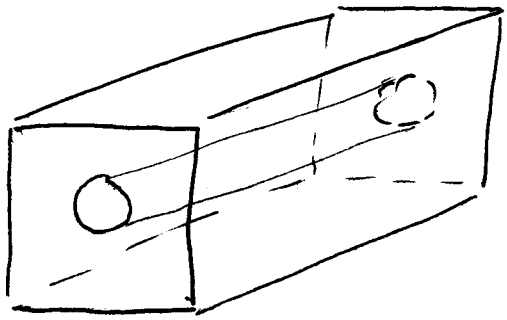
Problem 4.20

Steam Pipe
450 K



$D = 0.5m$
$W = 1.5m$

$$S = \frac{2\pi L}{\ln(1.08\, W/D)} \qquad \frac{W}{D} = 3$$

Calculate Heat Loss Per Unit Length

$$R = \frac{1}{SK} = \frac{1}{\frac{2\pi L}{\ln(1.08\, W/D)} K}$$

$$RL = \frac{\ln(1.08\, W/D)}{2\pi K} \qquad K = 1.4\ W/mK$$

$$RL = 0.1336\ \frac{mK}{W} \qquad \Delta T = 150K$$

$$q' = \frac{\Delta T}{R'} = 1123\ \frac{W}{m}$$