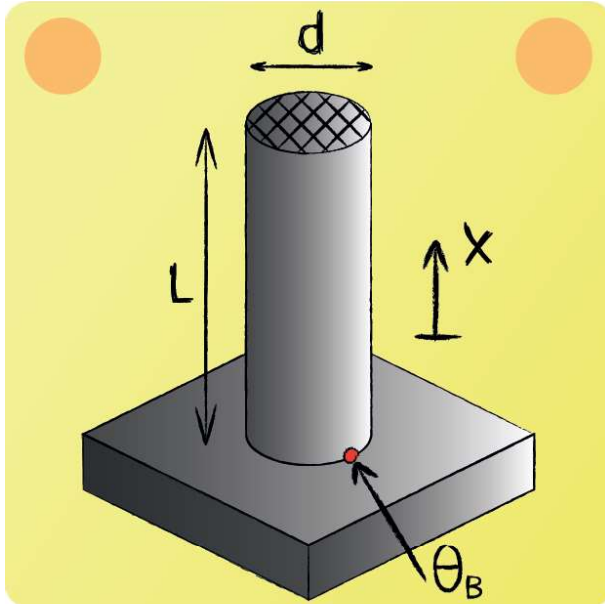


Conduction Fins 03



Calculate the transferred heat for the given fin with an adiabatic head!

Boundary conditions:

$$\theta(x = 0) = \theta_B$$

$$-\lambda \cdot \frac{d\theta}{dx} \Big|_{x=L} = 0$$

Heat flow through the fin:

$$\dot{Q} = \lambda \cdot A_c \cdot m \cdot \theta_B \cdot \tanh(m \cdot L)$$



Where:

$$m = \sqrt{\frac{4 \cdot \alpha}{\lambda \cdot d}}$$

$$A_c = \frac{1}{4} \pi d^2$$

And thus:

$$\dot{Q} = \lambda \cdot A_c = \frac{1}{4} \pi d^2 \cdot \sqrt{\frac{4 \cdot \alpha}{\lambda \cdot d}} \cdot \theta_B \cdot \tanh\left(\sqrt{\frac{4 \cdot \alpha}{\lambda \cdot d}} \cdot L\right)$$