

# Five Common BC for Heat xfer

FAM (5)  
6 Feb 2019

1. Knows the Temp

e.g.  $r = R$   $T = T_0$

2. Know the value of the flux

e.g.  $x = L$   $\frac{q_x}{A} = q_0$

( $q_0 = 0$   
insulated  
wall)

3. Newton's law of cooling

e.g.  $x = B$   $-k \frac{dT}{dx} = \frac{q_x}{A} = h \left( T_{\text{bulk}} - T_{\text{wall}} \right)$

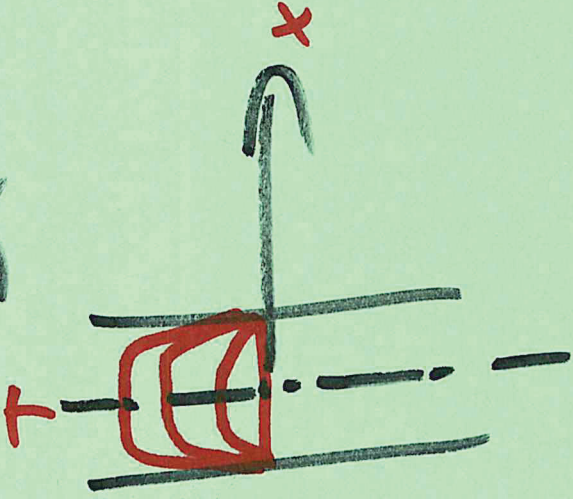
↓  $T(B)$

both parts needed

wall location

(6)

4. Symmetry



$$x=0$$

$$\frac{dT}{dx} = 0$$

max or min at

plane of symmetry

\* note:  
this is  
only true if  
the (e.g.  $r=0$ )  
Point is in  
the domain

5. Physically realizable solns \*

e.s.  $T = (\alpha)r + \frac{c_1}{r}$   $\rightarrow r$

at  $r=0 \Rightarrow c_1=0$   
 $T = \text{finite}$