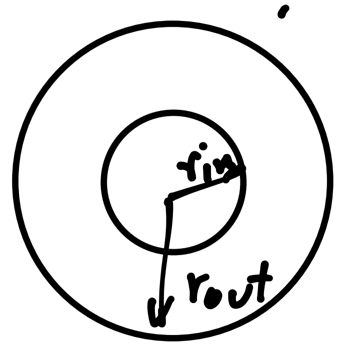
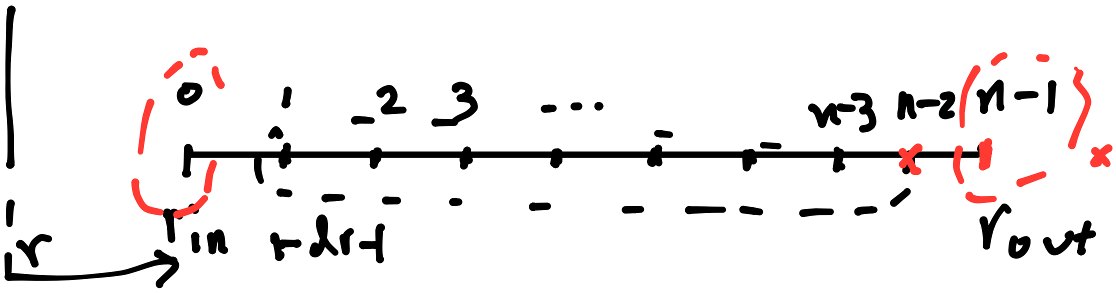
$$\frac{d^2T}{dr^2} + \frac{1}{r}\frac{dT}{dr} - \frac{2h'}{kt}(T - T_\infty) = 0$$



$r = r_{in}$ $\quad T = T_b$

$r = r_{out}$ $\quad -k\frac{dT}{dr} = h(T - T_\infty)$



$$dr = \frac{(r_{out} - r_{in})}{n-1}$$

$i = 1, 2, 3 \ldots n-2$ $\quad i > 0 \wedge i < n-1$ $\quad A_{i,i+1} = \frac{1}{dr^2} + \frac{1}{2r_i dr}$

$A_{i,i} = -\frac{2}{dr^2} - \frac{2h}{kt}$ $\quad B_i = -\frac{2h}{kt}T_\infty$ $\quad A_{i,i-1} = \frac{1}{dr^2} - \frac{1}{2r_i dr}$

$$\frac{T_{i+1} - 2T_i + T_{i-1}}{dr^2} + \frac{1}{r_i}\left(\frac{T_{i+1} - T_{i-1}}{2dr}\right) - \frac{2h}{kt}(T_i - T_\infty) = 0$$

$i = 0$ $\quad T_i = T_b$ $\quad A_{i,i} = 1$ $\quad B_i = T_b$

$i = n-1$ $\quad -k\left(\frac{T_i - T_{i-1}}{dr}\right) = h(T_i - T_\infty)$

$$\begin{array}{l} i=0 \rightarrow \\ i=1 \rightarrow \\ \rightarrow \end{array}\begin{bmatrix} & A & \end{bmatrix}\begin{bmatrix} T_0 \\ T_1 \\ \vdots \\ T_{n-1} \end{bmatrix} = \begin{bmatrix} B \end{bmatrix}$$

r	T
–	
–	
–	
–	

$$f(y(x))$$

$$y(x) \longrightarrow \boxed{f(x)} \longrightarrow f \circ y(x)$$

r	T	dT/dr
x	x	x
x	x	x