

→ Practice exams, review HW/DIS

### Topics to review

- 1) Steady-state 1D conduction w/o generation
- 2) Resistance concepts
- 3) Steady-state 1D conduction w/ generation
- 4) Extended surface approximation
- 5) Analytical sol'n for extended surfaces
- 6) Fin behavior
- 7) Fin efficiency & resistance
- 8) Numerical solutions to 1-D SS conduction

### 1) SS 1-D w/o Gen

- 1) Draw CV
- 2) Write e-bal
- 3) Taylor expansion
- 4) Sub. rate laws
- 5) Solve ODE (typically separable)

BC's important for  
drawing profiles &  
solving constants

### 2) Resistance

$$Q = \frac{\Delta T}{R}$$

IN SERIES, largest  $R$  is most imp.

" parallel, smallest  $R$  is most imp.

$$R_{rad} \propto \Delta T$$

### 3) SS 1D cond w/ gen

$$g = g''' V$$

$$g = \begin{cases} \text{planar} & \text{cyl} & \text{sph} \\ g''' A w dx & g''' 2\pi r L dr & g''' 4\pi r^2 dr \\ g''' \pi R^2 dx & & \end{cases}$$

	plane wall	cylinder	sphere
Governing diff eq			
$T_{\text{grid}}$			
Gen. sol.			

#### 4) Extended surface

- Biot used to approx. 2D as 1D

$$\text{Biot} = \frac{h r_{\text{cand}}}{k} \quad (\text{direction to neglect})$$

Use  $hL$  to see if  $T$  is closer to  $T_{\infty}$  or  $T_b$