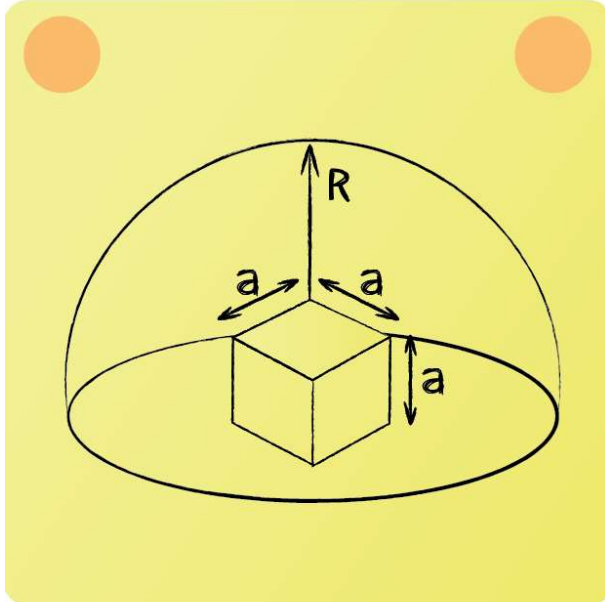


Exam Preparation - Radiation 1



Compute the net rate of heat transfer from the dome to the cube.

Reciprocity rule:

$$A_d \cdot \Phi_{dc} = A_c \cdot \Phi_{cd} \quad \Rightarrow \quad \Phi_{dc} = \frac{A_c}{A_d} = 0.06$$



Where:

$$A_c = 5 \cdot a^2$$

$$A_d = \frac{4}{2} \cdot \pi \cdot R^2 + \pi \cdot R^2 - a^2$$

And thus

$$\dot{Q}_{dc} = A_d \cdot \Phi_{dc} \cdot \sigma \cdot (T_d^4 - T_c^4) = 10.77 \text{ kW}$$