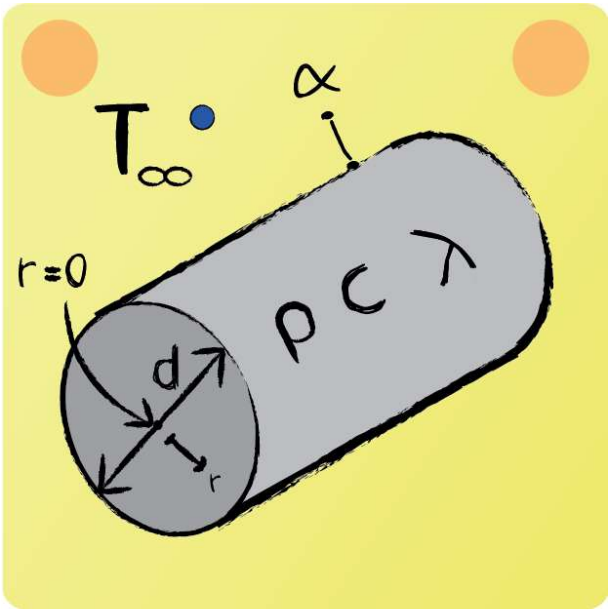
# Exam Preparation - Conduction 16

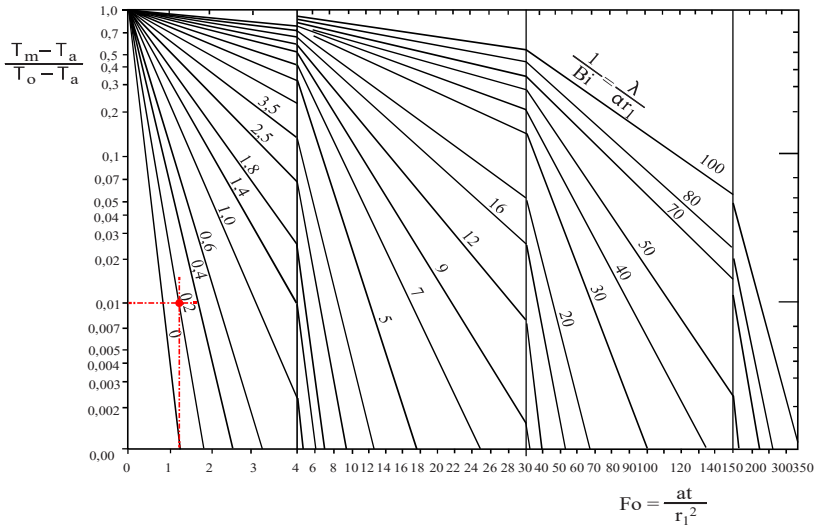



A cylinder of diameter $d = 0.5$ cm with initial homogeneous temperature $T(r, t = 0) = 293$ K, is suddenly exposed to a medium of temperature $T_\mathrm{A} = 353$ K. Determine the time $t_1$ at which $T(r = 0, t_1) = 352.4$ K is reached.

Problem type:
One-dimensional, unsteady heat conduction that does penetrate.

$$\frac{1}{\mathrm{Bi}} = \frac{\lambda}{\alpha \cdot r_1} = 0.2$$

$$\frac{T_\mathrm{m} - T_\mathrm{a}}{T_\mathrm{o} - T_\mathrm{a}} = 0.01$$




$$\rightarrow \mathrm{Fo} = 1.21$$

$$t = 6596.16 \text{ s}$$