$$T - T_0 = \frac{D - D_0}{D_0 \cdot \alpha}$$

Example: A hole is drilled in a copper sheet. The diameter of the hole is 4.24 cm at 27.0 °C. What is the change in the diameter of the hole when the sheet is heated to 227 °C? Coefficient of linear expansion of copper = 1.70 × 10⁻⁵ K⁻¹.

[NCERT Exercise]

$D_0 = 4.24 \text{ cm}.$

$T_0 = 27°C$

$D - D_0 = ?$

$T = 227°C$

$\alpha = 1.7 \times 10^{-5} K$

$\Delta T = 227 - 27 = 200°C$

$D - D_0 = D_0 \cdot \alpha \cdot \Delta T$

$= 4.24 \times 1.7 \times 10^{-5} \times 200$

$= \ldots \ldots$

Thermal stress :
$$Y = \frac{\text{stress}}{\text{strain}} = \frac{F/A}{\Delta l / L} \quad —\text{①}$$

T_0

L_0

⑧