

# Fin Temperature CDF Tool

## Calculation of Fin Temperature for Adiabatic Tip and Infinite Fins

The following CDF tool calculates the normalized fin temperature ( $\frac{\theta(x)}{\theta_{base}}$ ) for two cases:

- Case 1: Adiabatic fin tip
- Case 2: Infinitely long fin

In both cases, the cross sectional area of the fin is assumed to be constant.

We use the conventional definition of the fin eigenvalue  $m$ :

$$m = \sqrt{\frac{hP}{kA_c}}$$

where:

- $h$  is the convective heat transfer coefficient
- $P$  is the fin perimeter
- $k$  is the fin's thermal conductivity
- $A_c$  is the fin's cross-sectional area

## Graphical CDF Tool

The CDF tool follows. Note that the distance from the fin base is normalized by the fin length (i.e.,  $x$  in the formulas below represents the dimensional distance from the base divided by the fin length  $L$ ).