HYPERBOLIC FUNCTIONS

Hyperbolic sign of x = sinh x = (1/2)(ex – e-x)

Hyperbolic cosine of x = cosh x = (1/2)(ex + e-x)

For case I, after the boundary conditions are used the following equations result.

 C1 + C2 = θb

h(C1emL + C2e-mL) = km(C2e-mL –C1emL)

After rearranging the 2nd equation we have

 C1 + C2 = θb

Use determinant method to determine C1 and C2 as

Substitution in the general solution gives

Derivatives of hyperbolic functions

Derivative of the above temperature distribution

The derivative at x=0 will be of interest

The heat transfer from the base will be