Title
"Heat Transfer for a Cooling Fin"

Select
errlim= 1e-8
counters= 10          surfacegrid= 30

Variables
temp { degree (C) }

Definitions
{Basic SI units}
cm= 1e-2
c= 4*cm
d= 1 * cm
/* properties from text page 7-7 */
/* aluminum J/(m - s - degC) */
k= 247
/* forced convection */
h= 250
ambientTemp = 30
xFlux = -k*dx(temp)   yFlux= -k*dy(temp)
flux = -k*grad(temp)
convection = h *(temp - ambientTemp)

Initial Values

Equations
dx( xFlux )+ dy( yFlux)= 0

Constraints

Boundaries
region 1
start (0,-d)
natural(temp)= convection line to (c,-d)
natural(temp)= convection line to (c,d)
natural(temp)= convection line to (0,d)
value(temp)= 65 line to finish

Monitors

Plots
contour(temp)
vector(xFlux,yFlux) as "Direction of heat flow"
elevation( temp ) as "Temperature Distribution Along Center" from (0,0) to (c,0)
elevation( temp ) as "Temperature Distribution Along Top" from (0,d) to (c,d)
elevation( yFlux ) as "y_Flux Distribution Along Top" from (0,d) to (c,d)
elevation( xFlux ) as "x_Flux Distribution Along Center" from (0,0) to (c,0)

**End**

***Notifications***
Info: Loading PDEase2D Student v3.0.1 Small Node Limit Engine (2 Equation)
Info: Starting run...
Info: Last Status: Grid#5 | Nodes=1004 | Cells=475 | PDE Err=6.317E-5
Info: Run completed.
Normal Exit: PDEase server being shutdown.
Heat Transfer for a Cooling Fin

Contours:
- min: 61.05
- a: 61.2
- b: 61.4
- c: 61.6
- d: 62
- e: 62.4
- f: 62.6
- g: 63
- h: 63.2
- i: 63.6
- j: 63.8
- k: 64.2
- l: 64.4
- m: 64.8
- max: 65

PdzPit01Cont: Gr=5  err=6.317E-5

Heat Transfer for a Cooling Fin
Direction of heat flow

PdzPit02Vect: Gr=5  err=6.317E-5
Heat Transfer for a Cooling Fin
Temperature Distribution Along Center

\[ 0 \leq X \leq 0.04 \]
\[ 61.21 \leq f(X) \leq 65 \]
From \((0,0)\) to \((0.04,0)\)

Curves:
- \(\text{temp}\)
Area: 2.508

Heat Transfer for a Cooling Fin
Temperature Distribution Along Top

\[ 0 \leq X \leq 0.04 \]
\[ 61.05 \leq f(X) \leq 65 \]
From \((0,0.01)\) to \((0.04,0.01)\)

Curves:
- \(\text{temp}\)
Area: 2.501