

IIa.8.8

Solution to Example IIa.8.8

c This FORTRAN program calculates P & T of a charged volume
 c In this example, the volume contains air and is being charged with compressed air.

c Calculations in British Units (BU).

```

c
  implicit real*8(a-h,o-z)
  data Vol,P,T,Qdot/100.00,1000.00,150.00,0.00/
  data cp,R/0.24,53.35/
  data time,dt,ttt/0.0,0.1,60.00/
  data Wi,Ti/1.00,292.00/

c
  T=T+460.00
  Ti=Ti+460.00
  h=cp*T
  hi=cp*Ti
  c=144.00/778.00
  open(10,file='tank.out')
  am=144.*P*Vol/(R*T)
  write(10,4)
1  continue
  i=i+1
  v=vol/am
  dvdh=R/(144.00*P*cp)
  dvdp= - v/P
  anom=(Qdot+Wi*(hi-h))*dvdh+v*Wi
  dnom=am*dvdp+c*vol*dvdh
  dhdt=(Qdot+Wi*(hi-h)+c*Vol*dPdt)/am
  dPdt=-anom/dnom
  P=P+dPdt*dt
  h=h+dhdt*dt
  am=am+Wi*dt
  T=h/cp
  time=time+dt
  Tp=T-460.00
  if(time.lt.1.00) write(10,3) time,P,Tp,am
  if(time.gt.1.00.and.i.eq.10) write(10,3) time,P,Tp,am
  if(time.gt.1.00.and.i.eq.10) i=0
  if(time.gt.ttt) go to 2
  go to 1

c
2  continue
3  format(f10.2,f12.2,f12.2,f13.2)
4  format(5x'Time',6x,'Pressure',3x,'Temperature',5x,'Mass',6x,
1/,5x,' (s) ',4x,' (Psia)',6x,' (F) ',5x,' (lbm)')
  stop
  end

```