

## IIa.8.5

Solution to Problem IIa.8.5:

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.

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)')

c

```
stop
end
```