**mci.f90**

 program mci

! Projeto 6.2 - livro texto - 2 Nov 2019

 implicit real \*8 (a-h,o-z)

 parameter (nmax=1000)

 dimension vol(nmax),pres(nmax)

 open(unit=1,file='inpint.txt',status='old')

 open(unit=2,file='outint.txt',status='unknown')

 open(unit=3,file='diag-p-x-V.txt',status='unknown')

!

 read(1,\*)npontos,rpm,ncil

 write(2,\*)'npontos=',npontos,' rpm = ',rpm,' ncil = ',ncil

 do i=1,npontos

 read(1,\*)vol(i),pres(i)

 write(2,\*)vol(i),pres(i)

 write(3,\*)vol(i),pres(i)

 enddo

! Calcula trabalho indicado

! Ciclo completo

 sum=0.d0

 do i=1,npontos-1

 h=vol(i+1)-vol(i)

 sum=sum+h\*(pres(i)+pres(i+1))/2

 write(2,\*)'h= ',h

 enddo

 write(2,\*)'W\_adm\_comp\_comb\_exp\_exaustao =',sum,' J'

 ! Calculo do tempo de 2 rotacoes (1 ciclo completo)

 t\_ciclo=2.d0/(rpm/60)

 write(2,\*)'t\_ciclo =',t\_ciclo,' s'

 ! Calculo da potencia desenvolvida pelo ciclo do motor com 4 cilindros

 Pot\_1\_cil=sum/t\_ciclo/1000 ! kW

 write(2,\*)'Pot\_1\_cil =',Pot\_1\_cil,' kW'

 Pot\_total=ncil\*Pot\_1\_cil

 write(2,\*)'Pot\_total =',Pot\_total,' kW'

 Pot\_total\_hp=Pot\_total/0.736d0

 write(2,\*)'Pot\_total\_HP =',Pot\_total\_hp,' HP'

 close(2)

 close(3)

 call system("notepad outint.txt")

 call system("wgnuplot dados-p-x-V.gnu")

 stop

 end

!

!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**dados-p-x-V.gnu**

set data style linespoints

set grid

set xlabel 'V (m3)'

set ylabel 'P (N/m2)'

set title 'Diagrama P x V - Motor a Combustao Interna ICO - MCI'

plot 'diag-p-x-V.txt'

pause -1

**inpint.txt**

30 3000.d0 6 ! npontos = Nr de pontos de integracao; rpm = rotacao do motor; ncil = Nr de cilindros do motor

6.d-5 1.d5 ! Admissao

1.d-4 5.d4

5.d-4 4.d4

1.d-3 3.d4

1.04d-3 3.d4

6.d-4 1.d5 ! Compressao

4.d-4 2.d5

3.d-4 2.5d5

2.d-4 4.d5

1.5d-4 6.d5

1.d-4 1.d6

6.d-5 2.d6

7.d-5 2.6d6 ! Combustao

1.d-4 2.25d6 ! Expansao

1.5d-4 1.8d6

2.d-4 1.4d6

3.d-4 1.d6

4.d-4 7.d5

5.d-4 4.d5

6.d-4 3.d5

7.d-4 2.5d5

8.d-4 2.3d5

9.d-4 2.d5

1.d-3 1.8d5

1.04d-3 1.7d5

1.d-3 1.d5 ! Exaustao

3.d-4 2.5d5

1.3d-4 3.d5

1.d-4 2.7d5

6.d-5 1.d5