```
-->// Mat01186  2016/2   P1-A

-->// Questao 1

-->function u=f(x)
-->  u=x**5-3*x-1; endfunction

-->// dominio:: toda a reta

-->vx=[-20:.01:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-8:.01:8];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-4:.01:4];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-2:.01:2];vy=feval(vx,f);plot(vx,vy);xgrid

-->// raiz simples no intervalo [-1.22, -1.2]

-->// raiz simples no intervalo [-0.35, -0.33]

-->// raiz simples no intervalo [1.38, 1.40]

-->// (b) Metodo de Newton

-->function u=d(x)
--> u = 5*x**4-3;endfunction

-->n=0;xn=-1.22;[n xn]
 ans  =

    0.  - 1.22

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    1.  - 1.2147122

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    2.  - 1.2146481

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    3.  - 1.214648

-->////////////////////

-->n=0;xn=-0.33;[n xn]
 ans  =

    0.  - 0.33

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    1.  - 0.3347314

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    2.  - 0.3347341

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    3.  - 0.3347341

-->////////////////////////////

-->n=0;xn=1.39;[n xn]
 ans  =

    0.    1.39

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    1.    1.3887945

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    2.    1.388792

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    3.    1.388792
```



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-->// Questao 2

-->function u=f(x)
--> u = 6*sqrt(x+1) - x**(-2);endfunction

-->// dominio:  x > -1, x diff 0 ou seja:

-->// D = (-1,0) U (0,inf)

-->vx=[-1:.01:-0.1];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-1:.001:-0.4];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-1:.001:-0.4];vy=feval(vx,f);plot(vx,vy);xgrid

-->// raiz simples no intervalo [-0.97, -0.965]

-->// raiz simples no intervalo [-0.485, -0.48]

-->vx=[0.1:.001:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[0.1:.001:0.2];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[0.1:.001:2];vy=feval(vx,f);plot(vx,vy);xgrid

-->// raiz simples no intervalo [0.37, 0.38]

-->// (b) Metodo de Stephensen (MST)

-->n=0; xn=-0.97;[n xn]
 ans  =

    0.  - 0.97

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    1.  - 0.9689068

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    2.  - 0.9684547

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    3.  - 0.9684177

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    4.  - 0.9684175

-->////////////////////////////

-->n=0; xn=-0.485;[n xn]
 ans  =

    0.  - 0.485

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    1.  - 0.4817772

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    2.  - 0.4810154

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    3.  - 0.4809820

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    4.  - 0.4809819

-->////////////////////////////////////

-->n=0; xn=0.375;[n xn]
 ans  =
```

```
    0.    0.375

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    1.    0.3763465

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    2.    0.3768347

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    3.    0.3768775

-->n=n+1;dn=(f(xn+f(xn))-f(xn))/f(xn);xn=xn-f(xn)/dn;[
n xn]
 ans  =

    4.    0.3768778

-->//  Questao 3

-->function u=f(x)
--> u = exp(-x*x)-x*x-2*x+2;endfunction

-->// dominio:: toda a reta

-->vx=[-20:.001:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-5:.001:2.5];vy=feval(vx,f);plot(vx,vy);xgrid

-->// raiz simples no intervalo [-2.74, -2.72]

-->// raiz simples no intervalo [0.85, 0.9]

-->// (b) Metodo de Newton (MNR)

-->function u=d(x)
--> u = -2*x*exp(-x*x)-2*x-2; endfunction

-->n=0; xn=-2.73;[n xn]
 ans  =

    0.  - 2.73

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    1.  - 2.7322176

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    2.  - 2.7322161

-->////////////////////////////

-->n=0; xn=0.88;[n xn]
 ans  =

    0.    0.88

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    1.    0.8639391

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    2.    0.8638963

-->n=n+1; xn=xn-f(xn)/d(xn);[n xn]
 ans  =

    3.    0.8638963

-->// Questao 4

-->function u=f(x)
--> u = log(x) + exp(x-2);endfunction

-->// dominio: x > 0

-->vx=[0.1:.001:10]; vy=feval(vx,f);plot(vx,vy);xgrid
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```
-->vx=[0.1:.001:5]; vy=feval(vx,f);plot(vx,vy);xgrid

-->// raiz simples no intervalo [ 0.74, 0.76 ]

-->// (b) metodo da secante

-->n=0; xa=0.74; xn=0.76;[n xn]
 ans  =

    0.    0.76

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    1.    0.7507728

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    2.    0.7507268

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    3.    0.7507270

-->////////////////////////////

-->// Questao 5

-->function u=f(x)
--> u = 2/(1+x**2) - 1/(2*x**3);endfunction

-->// dominio: x diff 0

-->// D = (-inf, 0) U (0, inf)

-->vx=[-20:.001:-0.1];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-20:.001:-0.3];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[-20:.001:-3];vy=feval(vx,f);plot(vx,vy);xgrid

-->// nao existem raizes negativas

-->vx=[0.1:.001:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[0.2:.001:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[0.3:.001:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->vx=[0.4:.001:20];vy=feval(vx,f);plot(vx,vy);xgrid

-->// raiz simples no intervalo [0.7, 0.75]

-->vx=[6:.001:30];vy=feval(vx,f);plot(vx,vy);xgrid

-->// (b) metodo da secante

-->n=0; xa=0.7; xn=0.75;[n xn]
 ans  =

    0.    0.75

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    1.    0.7274528

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    2.    0.7250752

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    3.    0.7252716

-->n=n+1; dn=(f(xn)-f(xa))/(xn-xa);xa=xn;xn=xn-f(xn)/d
n;[n xn]
 ans  =

    4.    0.7252701

-->diary(0)
```