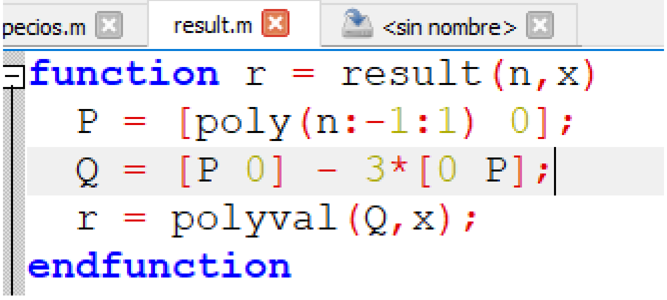
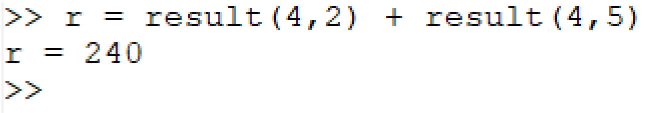
1)

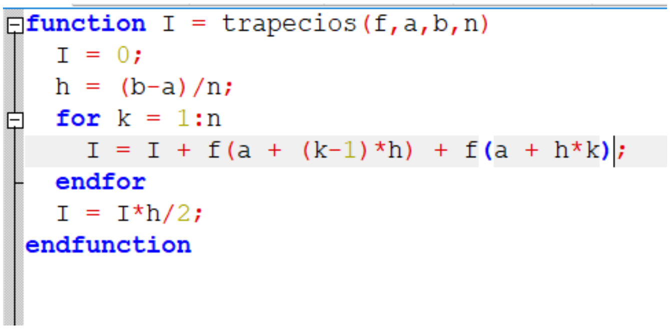


```
function r = result(n,x)
  P = [poly(n:-1:1) 0];
  Q = [P 0] - 3*[0 P];
  r = polyval(Q,x);
endfunction
```

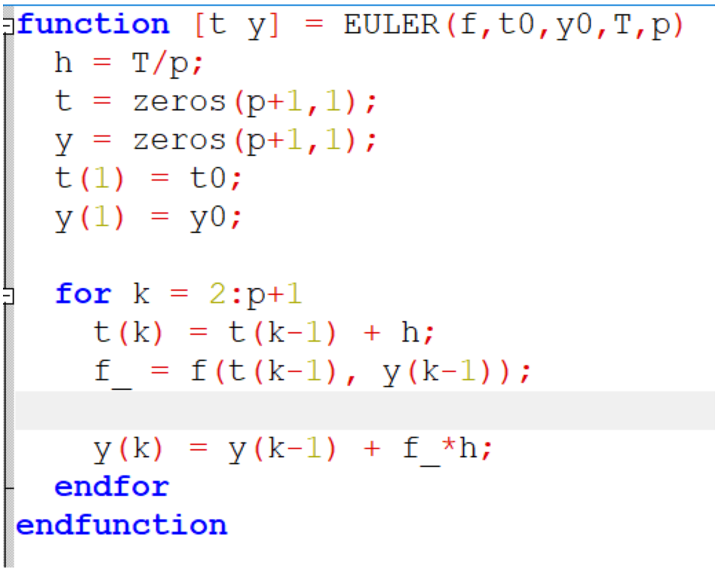


```
>> r = result(4,2) + result(4,5)
r = 240
>>
```

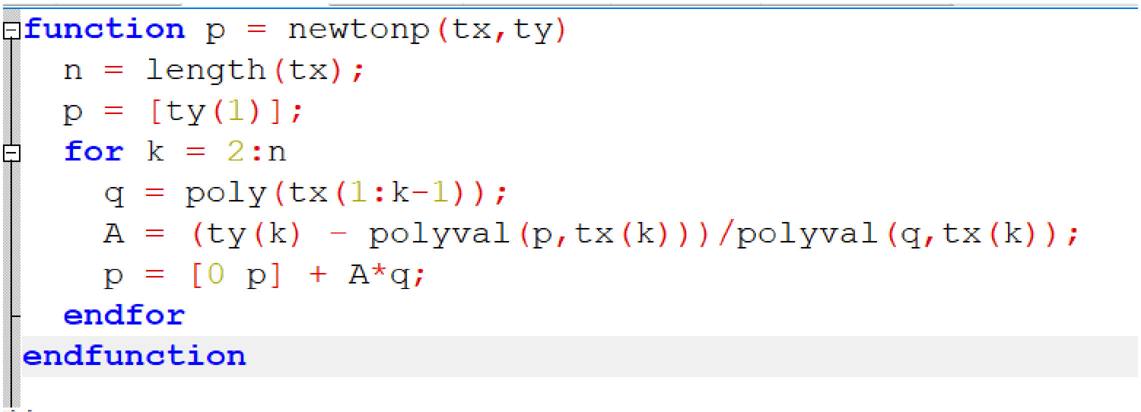
2)



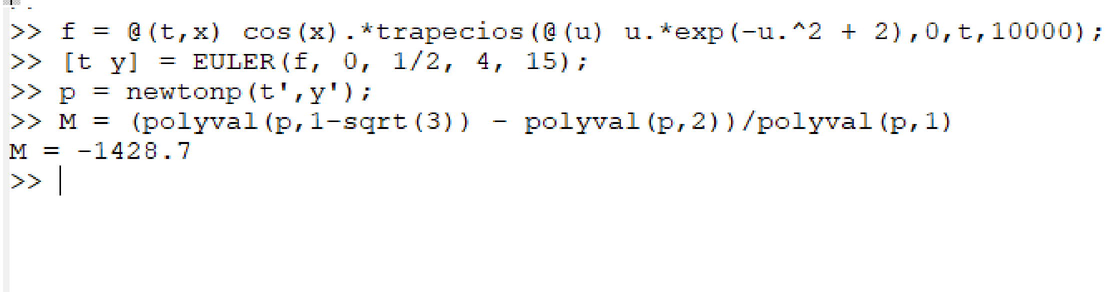
```
function I = trapecios(f,a,b,n)
  I = 0;
  h = (b-a)/n;
  for k = 1:n
    I = I + f(a + (k-1)*h) + f(a + h*k);
  endfor
  I = I*h/2;
endfunction
```



```
function [t y] = EULER(f,t0,y0,T,p)
  h = T/p;
  t = zeros(p+1,1);
  y = zeros(p+1,1);
  t(1) = t0;
  y(1) = y0;

  for k = 2:p+1
    t(k) = t(k-1) + h;
    f_ = f(t(k-1), y(k-1));

    y(k) = y(k-1) + f_*h;
  endfor
endfunction
```

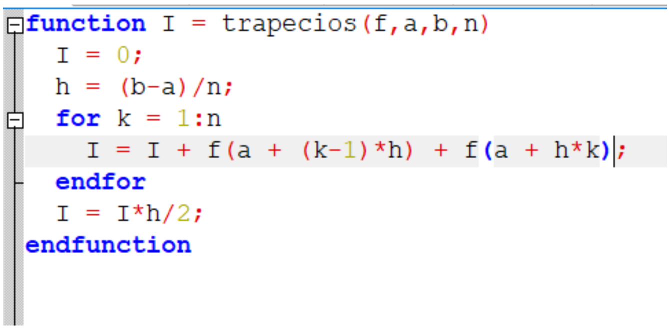


```
function p = newtonp(tx,ty)
  n = length(tx);
  p = [ty(1)];
  for k = 2:n
    q = poly(tx(1:k-1));
    A = (ty(k) - polyval(p,tx(k)))/polyval(q,tx(k));
    p = [0 p] + A*q;
  endfor
endfunction
```

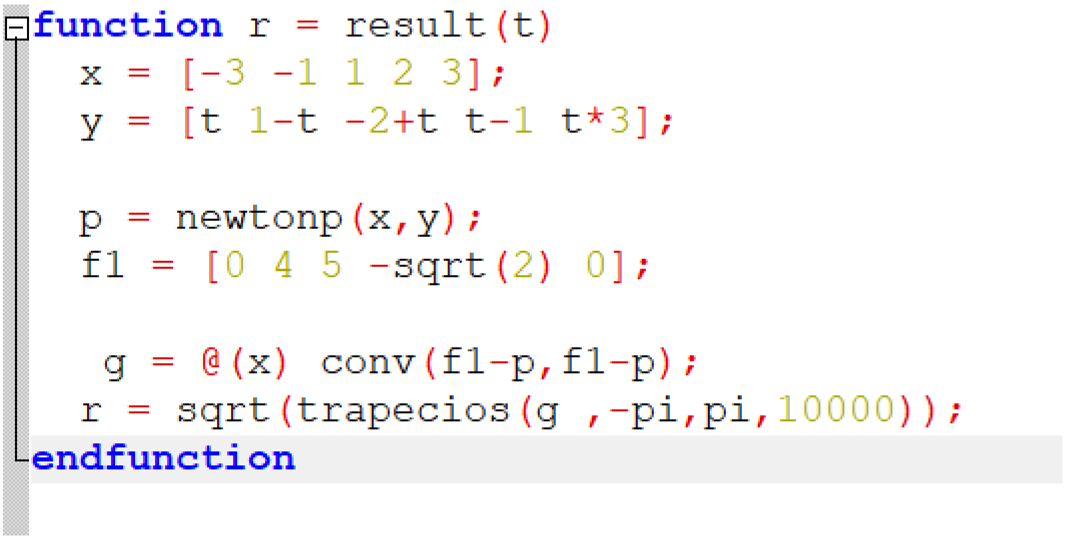


```
>> f = @(t,x) cos(x).*trapecios(@(u) u.*exp(-u.^2 + 2),0,t,10000);
>> [t y] = EULER(f, 0, 1/2, 4, 15);
>> p = newtonp(t',y');
>> M = (polyval(p,1-sqrt(3)) - polyval(p,2))/polyval(p,1)
M = -1428.7
>>
```

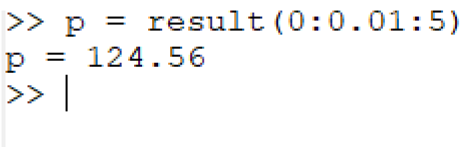
3)



```
function I = trapecios(f,a,b,n)
  I = 0;
  h = (b-a)/n;
  for k = 1:n
    I = I + f(a + (k-1)*h) + f(a + h*k);
  endfor
  I = I*h/2;
endfunction
```

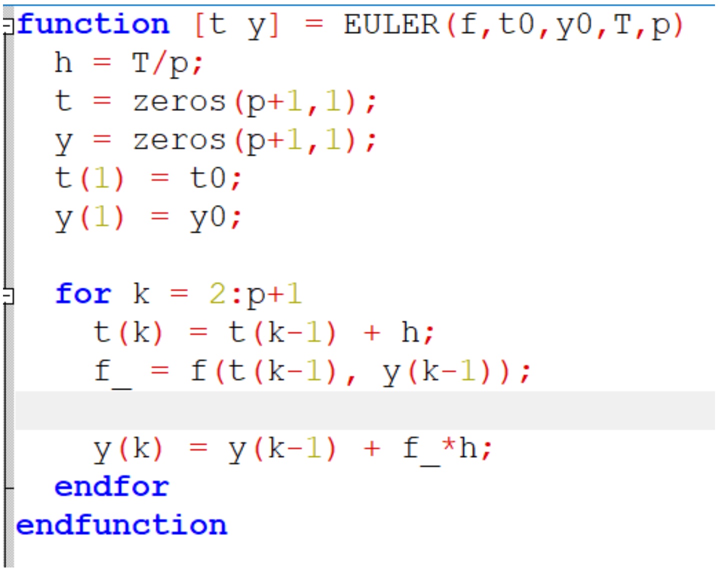


```
function r = result(t)
  x = [-3 -1 1 2 3];
  y = [t 1-t -2+t t-1 t*3];

  p = newtonp(x,y);
  f1 = [0 4 5 -sqrt(2) 0];

   g = @(x) conv(f1-p,f1-p);
  r = sqrt(trapecios(g ,-pi,pi,10000));
endfunction
```

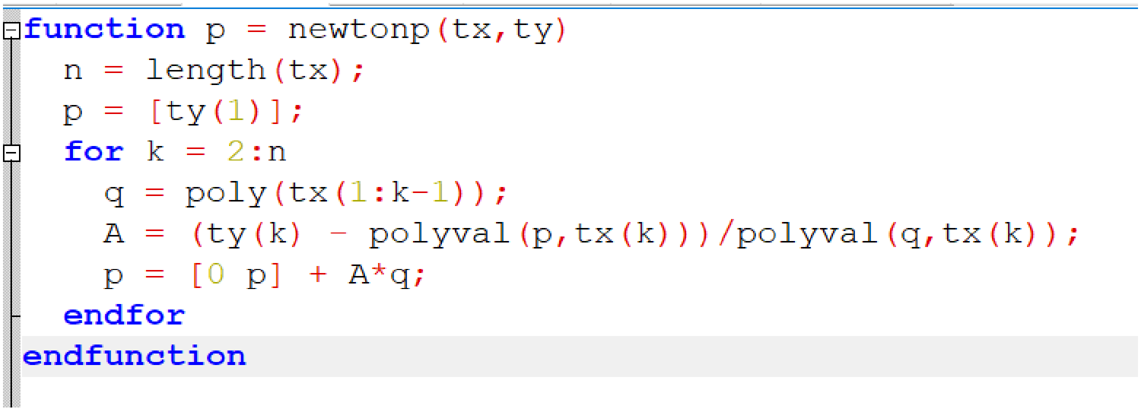


```
>> p = result(0:0.01:5)
p = 124.56
>>
```

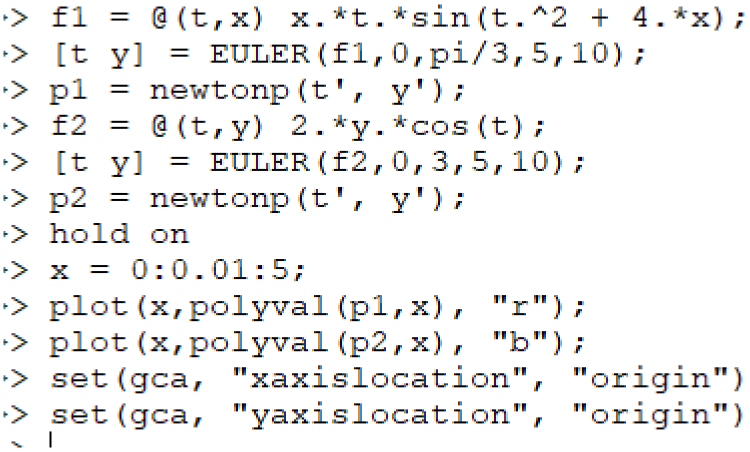
4)



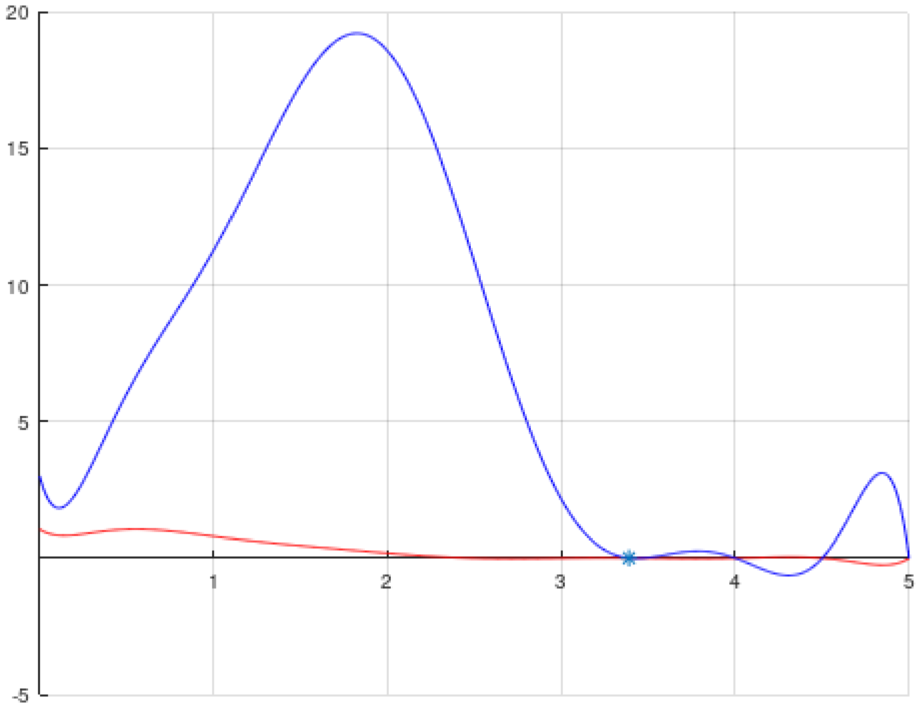
```
function [t y] = EULER(f,t0,y0,T,p)
  h = T/p;
  t = zeros(p+1,1);
  y = zeros(p+1,1);
  t(1) = t0;
  y(1) = y0;

  for k = 2:p+1
    t(k) = t(k-1) + h;
    f_ = f(t(k-1), y(k-1));

    y(k) = y(k-1) + f_*h;
  endfor
endfunction
```



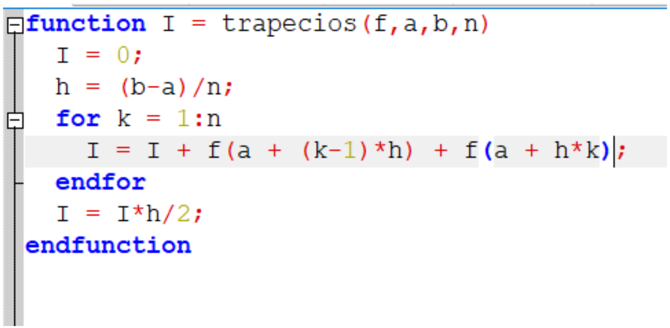
```
function p = newtonp(tx,ty)
  n = length(tx);
  p = [ty(1)];
  for k = 2:n
    q = poly(tx(1:k-1));
    A = (ty(k) - polyval(p,tx(k)))/polyval(q,tx(k));
    p = [0 p] + A*q;
  endfor
endfunction
```



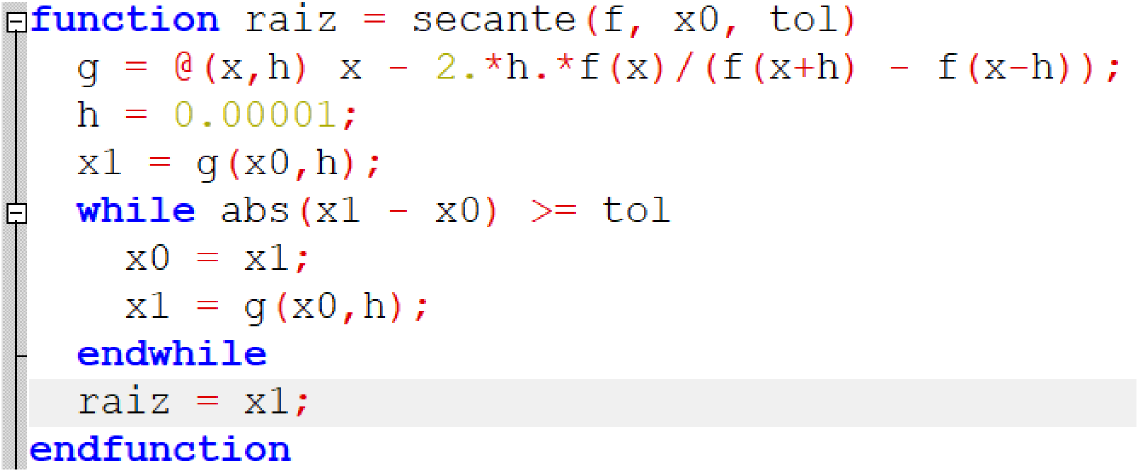
```
> f1 = @(t,x) x.*t.*sin(t.^2 + 4.*x);
> [t y] = EULER(f1,0,pi/3,5,10);
> p1 = newtonp(t', y');
> f2 = @(t,y) 2.*y.*cos(t);
> [t y] = EULER(f2,0,3,5,10);
> p2 = newtonp(t', y');
> hold on
> x = 0:0.01:5;
> plot(x,polyval(p1,x), "r");
> plot(x,polyval(p2,x), "b");
> set(gca, "xaxislocation", "origin")
> set(gca, "yaxislocation", "origin")
```



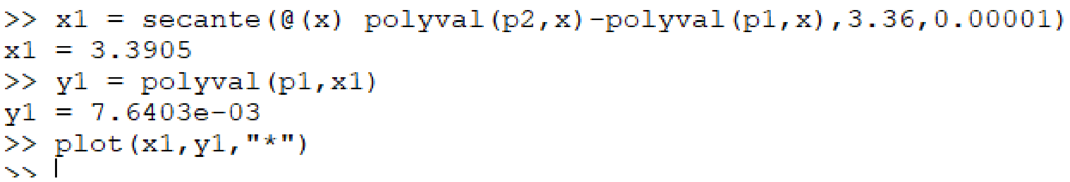
Área:



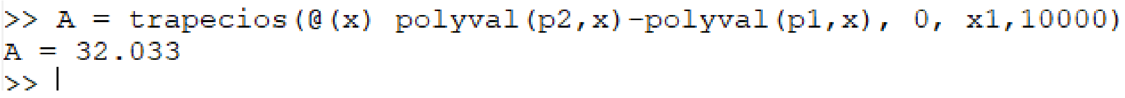
```
function I = trapecios(f,a,b,n)
  I = 0;
  h = (b-a)/n;
  for k = 1:n
    I = I + f(a + (k-1)*h) + f(a + h*k);
  endfor
  I = I*h/2;
endfunction
```



```
function raiz = secante(f, x0, tol)
  g = @(x,h) x - 2.*h.*f(x)/(f(x+h) - f(x-h));
  h = 0.00001;
  x1 = g(x0,h);
  while abs(x1 - x0) >= tol
    x0 = x1;
    x1 = g(x0,h);
  endwhile
  raiz = x1;
endfunction
```

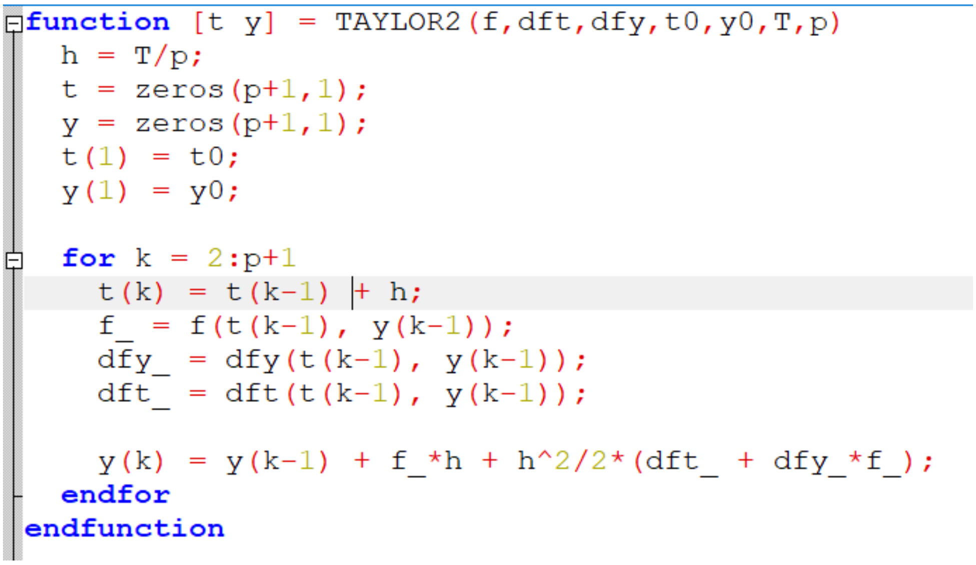


```
>> x1 = secante(@(x) polyval(p2,x)-polyval(p1,x),3.36,0.00001)
x1 = 3.3905
>> y1 = polyval(p1,x1)
y1 = 7.6403e-03
>> plot(x1,y1,"*")
>>
```

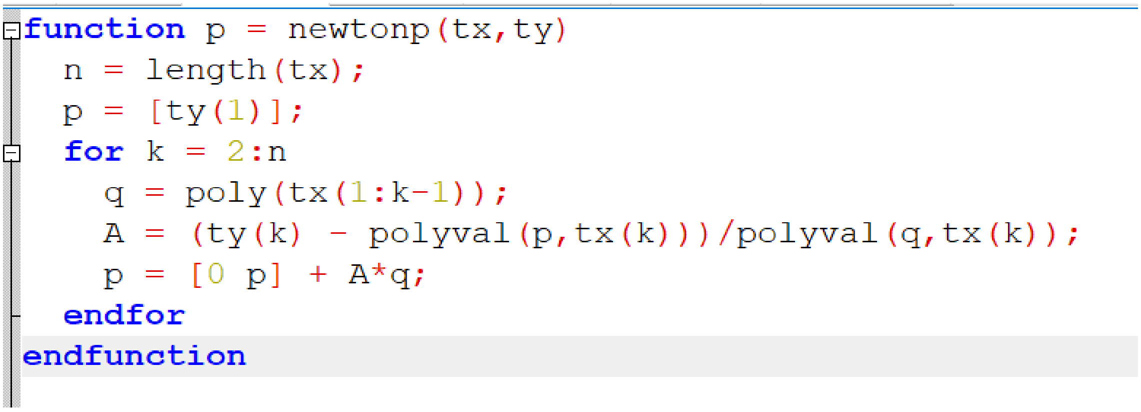


```
>> A = trapecios(@(x) polyval(p2,x)-polyval(p1,x), 0, x1,10000)
A = 32.033
>> 
```

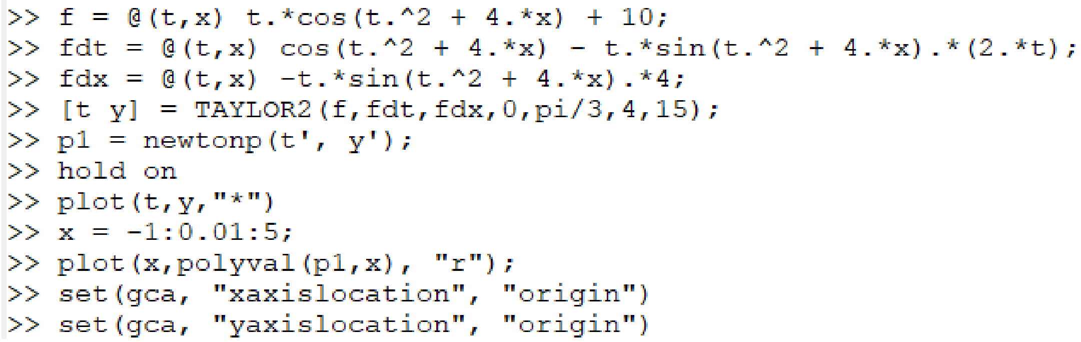
5)



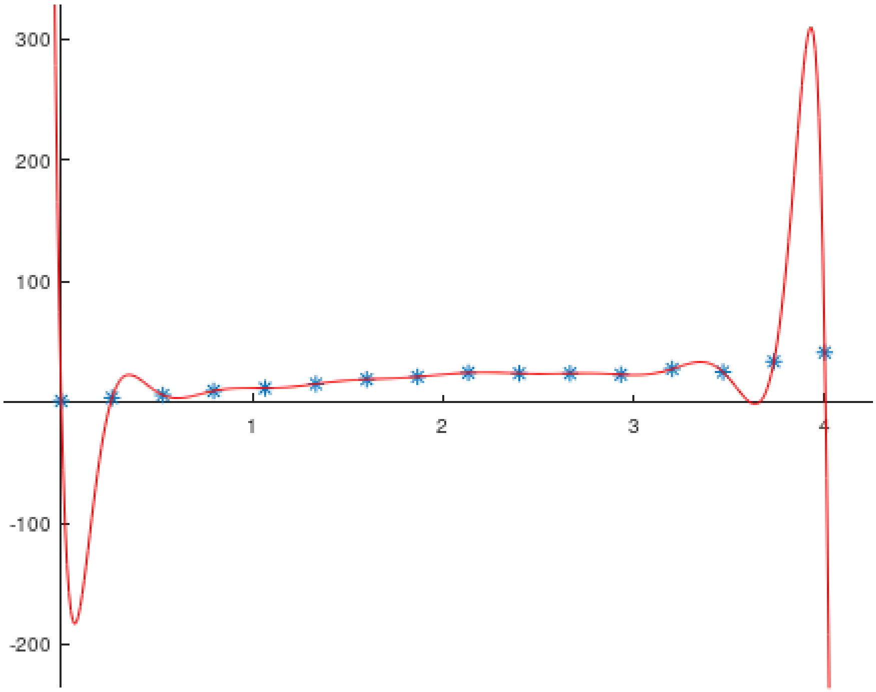
```
function [t y] = TAYLOR2(f,dft,dfy,t0,y0,T,p)
  h = T/p;
  t = zeros(p+1,1);
  y = zeros(p+1,1);
  t(1) = t0;
  y(1) = y0;

  for k = 2:p+1
    t(k) = t(k-1) + h;
    f_ = f(t(k-1), y(k-1));
    dfy_ = dfy(t(k-1), y(k-1));
    dft_ = dft(t(k-1), y(k-1));

    y(k) = y(k-1) + f_*h + h^2/2*(dft_ + dfy_*f_);
  endfor
endfunction
```



```
function p = newtonp(tx,ty)
  n = length(tx);
  p = [ty(1)];
  for k = 2:n
    q = poly(tx(1:k-1));
    A = (ty(k) - polyval(p,tx(k)))/polyval(q,tx(k));
    p = [0 p] + A*q;
  endfor
endfunction
```



```
>> f = @(t,x) t.*cos(t.^2 + 4.*x) + 10;
>> fdt = @(t,x) cos(t.^2 + 4.*x) - t.*sin(t.^2 + 4.*x).*(2.*t);
>> fdx = @(t,x) -t.*sin(t.^2 + 4.*x).*4;
>> [t y] = TAYLOR2(f,fdt,fdx,0,pi/3,4,15);
>> p1 = newtonp(t', y');
>> hold on
>> plot(t,y,"*")
>> x = -1:0.01:5;
>> plot(x,polyval(p1,x), "r");
>> set(gca, "xaxislocation", "origin")
>> set(gca, "yaxislocation", "origin")
```


300
200
100
-100
-200
1
2
3
4