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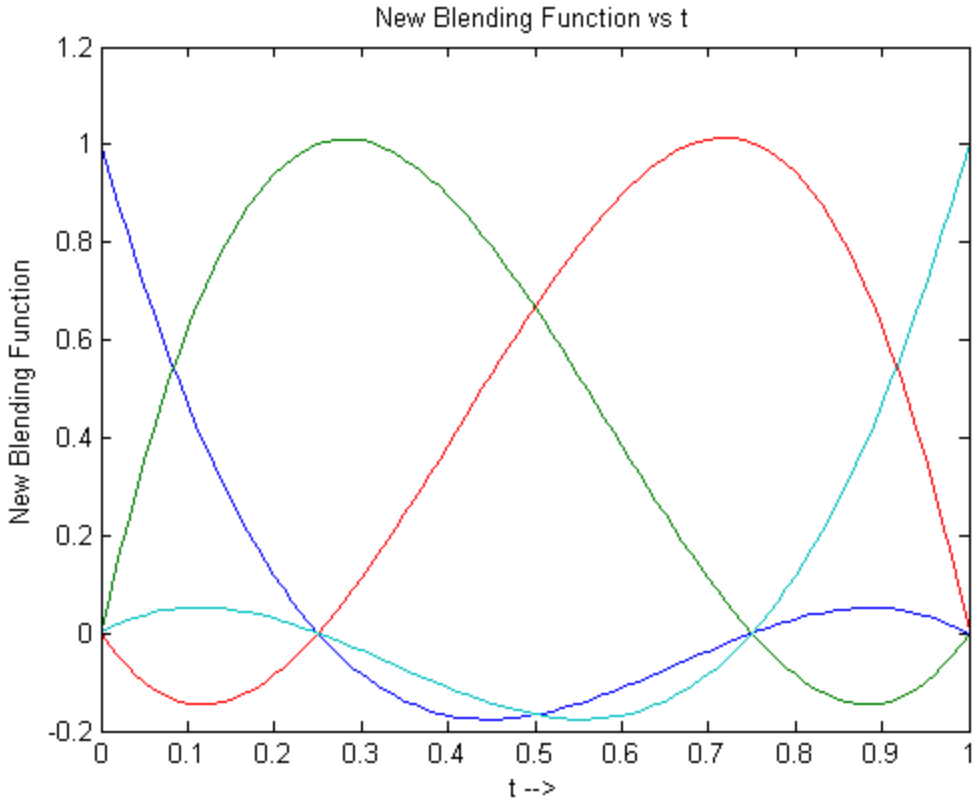
# Four-point_Interpolation

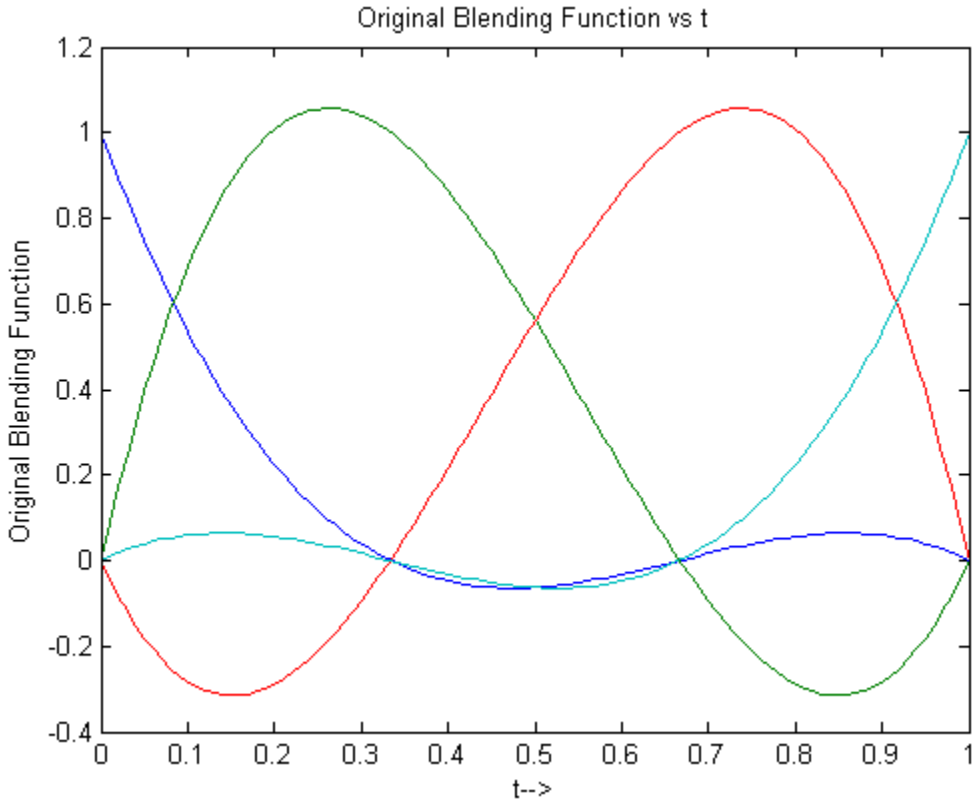
```
close all ; clc ; clear all;
```

# 2c)

```
t  = [0:0.01:1]';                              %Values of t
B1 = [-5.334 10.667 -10.667 5.334; ...         %Second Formulation of
      10.667 -18.667 13.34 -5.334; ...         %Blending Function
     -6.334 8 -2.667 1 ;...
      1  0 0 0 ]
T = [t.^3, t.^2, t ,ones(101,1)];              % T(t) =[t^3 t^2 t 1]

P1 = T*B1;                                     % P1 = T(t) * M
figure();
plot(t,P1)                                     % Plot New Blending Function
xlabel('t -->');
ylabel('New Blending Function');
title('New Blending Function vs t');

B2= [-4.5 13.5 -13.5 4.5;                      % Original Blending Function
      9.0 -22.5 18 -4.5;
      -5.5 9.0 -4.5 1.0;
       1.0 0 0 0];

P2 = T*B2;                                     % P2 = T(t)* M
figure();
plot(t,P2)                                     %PLot Original Blending Fn
xlabel('t-->');
ylabel('Original Blending Function');
title('Original Blending Function vs t');
```

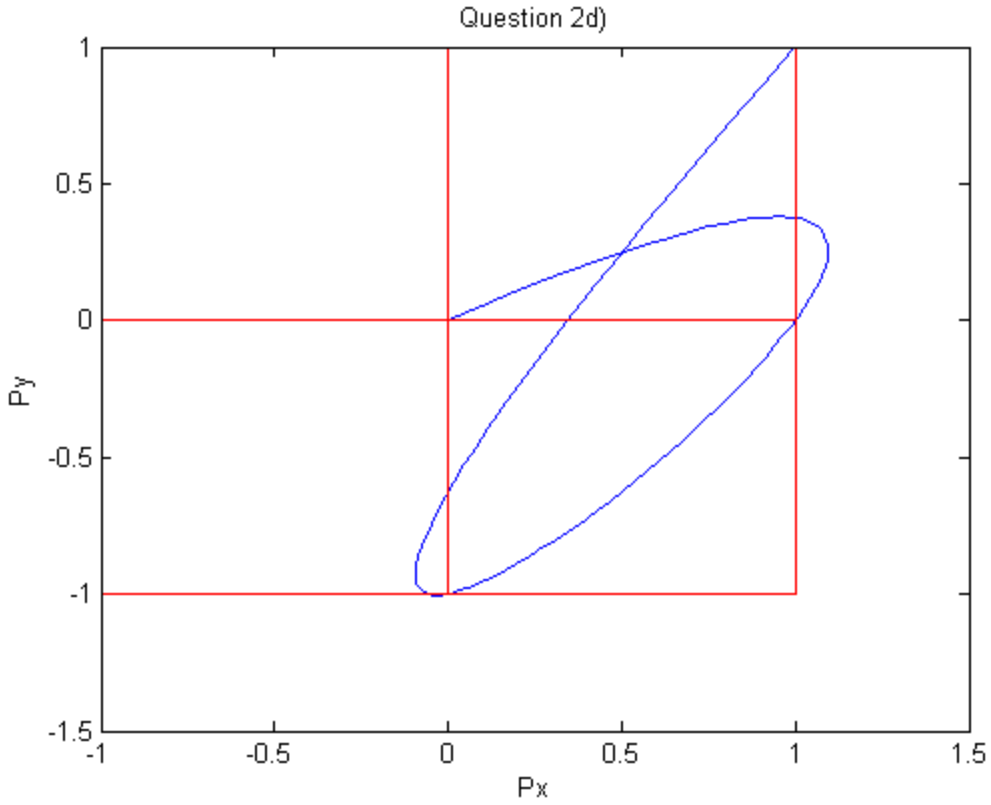
```
B1 =

   -5.3340   10.6670  -10.6670    5.3340
   10.6670  -18.6670   13.3400   -5.3340
   -6.3340    8.0000   -2.6670    1.0000
    1.0000         0         0         0
```


New Blending Function vs t
New Blending Function
t -->
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Original Blending Function vs t
Original Blending Function
t-->
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

# 2d) Plot the Original 4-point interpolation curve for given points

```
Pt = P2*[0 0 ; 1 0 ; 0 -1 ;  1 1 ];

figure();
plot(Pt(:,1) , Pt(:,2))
title('Question 2d)')
xlabel('Px')
ylabel('Py')
linex = zeros(1) * t ;
hold on;
plot(linex,t,'r')
plot(t,linex,'r')
plot(linex,-t,'r')
plot(-t , linex , 'r')

linex1 = ones(1,101)*1;
hold on;
plot(linex1,t,'r');
plot(t,linex1,'r');
plot(linex1,-t,'r');
plot(-t , linex1 , 'r');

linex2 = ones(1,101)*-1;
hold on;
plot(linex2,t,'r');
plot(t,linex2,'r');
plot(linex2,-t,'r');
plot(-t , linex2 , 'r');
```

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