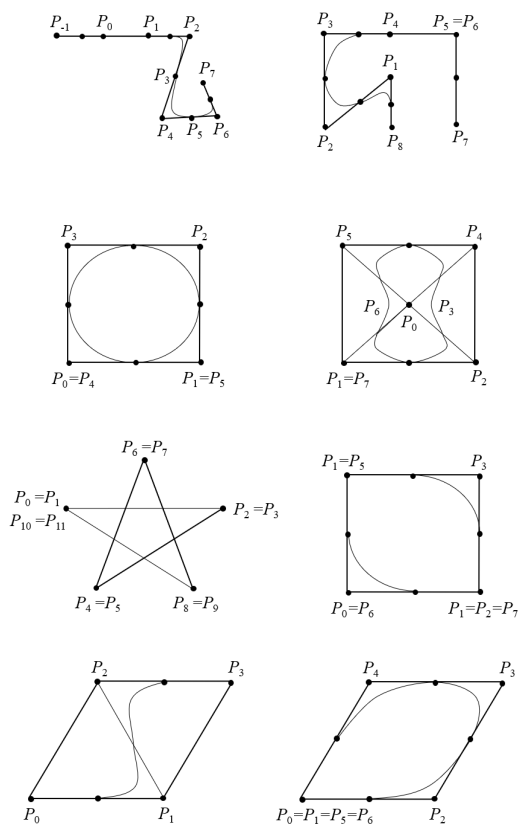


题目概览:

作业:

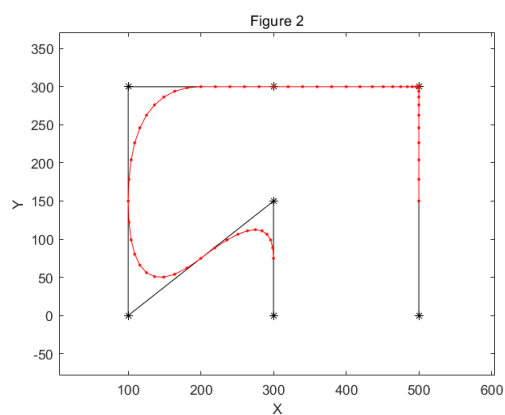
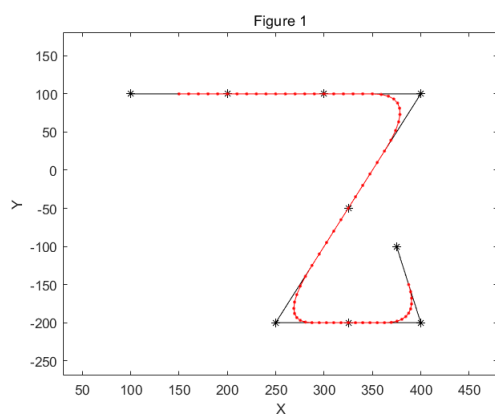
P48. 2、4任选一题

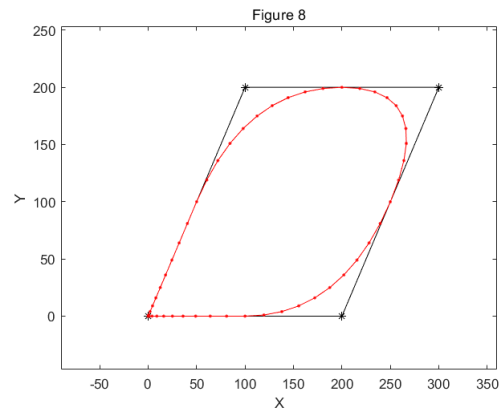
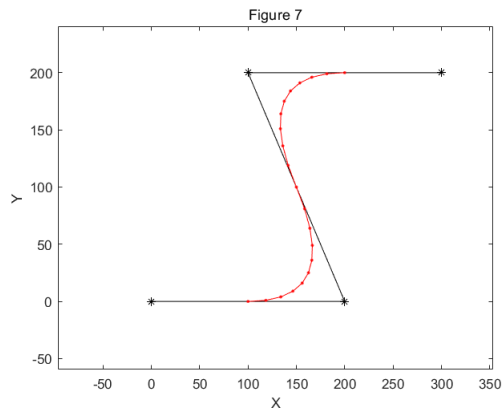
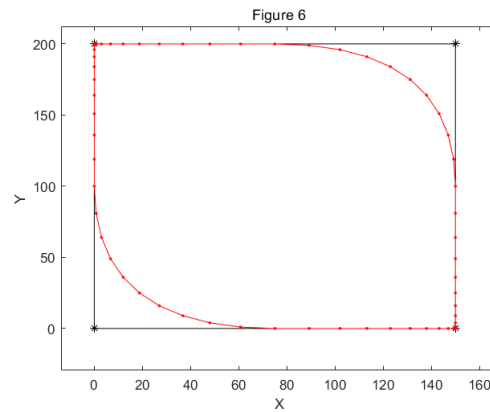
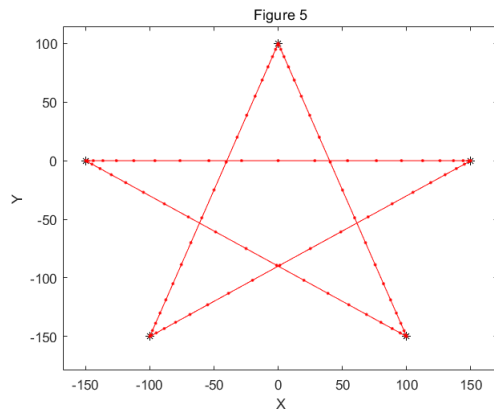
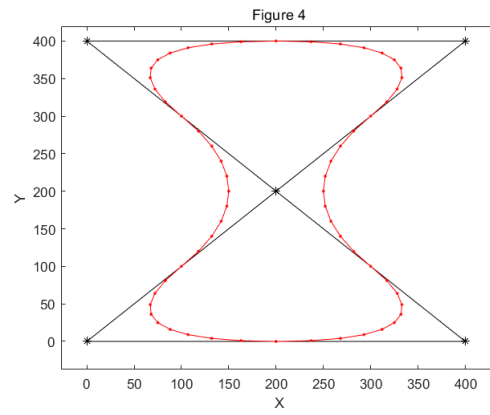
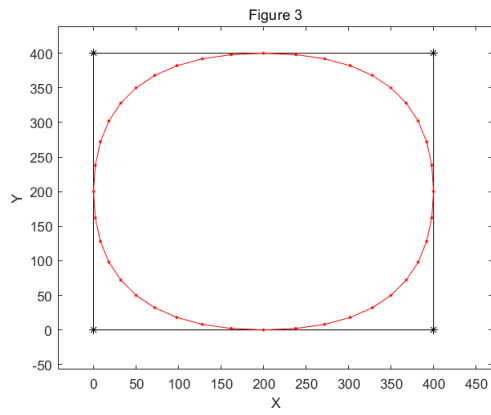
1. 设计B样条曲线的流程图。(P48, 第2题)
2. 编程实现下面的二次B样条曲线 (P48, 第4题)



P48, 第4题: 编程实现二次B样条曲线

结果:





Matlab 代码

```

1  % 初始点
2  figure(1)
3  % 初始点
4  p = [100,100; 200,100; 300,100; 400,100; ...
5       325,-50; 250,-200; 325,-200; 400,-200; 375,-100];
6  Bcurve_print(p);
7  title("Figure 1");
8  xlabel("X");
9  ylabel("Y");
10
11 figure(2)
12 p = [300,0; 300,150; 100,0; 100,300; ...
13      300,300; 500,300; 500,300; 500,0];
14 Bcurve_print(p);
15 title("Figure 2");
16 xlabel("X");
17 ylabel("Y");
18

```

```

19 figure(3)
20 p = [0,0; 400,0; 400,400; 0,400; 0,0; 400,0];
21 Bcurve_print(p);
22 title("Figure 3");
23 xlabel("X");
24 ylabel("Y");
25
26 figure(4)
27 p = [200,200;0,0; 400,0; 200,200; 400,400; ...
28      0,400; 200,200; 0,0;];
29 Bcurve_print(p);
30 title("Figure 4");
31 xlabel("X");
32 ylabel("Y");
33
34 figure(5)
35 p = [-150,0;-150,0; 150,0;150,0;-100,-150;-100,-150; ...
36      0,100; 0,100; 100,-150; 100,-150;-150,0;-150,0;];
37 Bcurve_print(p);
38 title("Figure 5");
39 xlabel("X");
40 ylabel("Y");
41
42 figure(6)
43 p = [0,0; 150,0; 150,0; 150,200; 0,200; 0,200; 0,0; 150,0];
44 Bcurve_print(p);
45 title("Figure 6");
46 xlabel("X");
47 ylabel("Y");
48
49 figure(7)
50 p = [0,0; 200,0; 100,200; 300,200];
51 Bcurve_print(p);
52 title("Figure 7");
53 xlabel("X");
54 ylabel("Y");
55
56 figure(8)
57 p = [0,0; 0,0; 200,0; 300,200; 100,200; 0,0; 0,0;];
58 Bcurve_print(p);
59 title("Figure 8");
60 xlabel("X");
61 ylabel("Y");
62
63 function Bcurve_print(p)
64 %BCURVE_PRINT B样条曲线绘制
65 % Bcurve_print(p,n) p为型值点size(p)=[n,2], n为型值点个数
66 n = size(p,1);
67 % 绘制控制多边形
68 plot(p(:,1),p(:,2),"k*-");
69 hold on
70 % 循环3点插值
71 for i=1:n-2
72     % 公式初始点
73     z1 = (p(i,:)-2*p(i+1,:)+p(i+2,:))/2;
74     z2 = -p(i,:)+p(i+1,:);
75     z3 = (p(i,:)+p(i+1,:))/2;
76     m = 10;

```

```
77     xy = zeros(m+1,2); % 插值点
78     xy(1,:) = z3;
79     for j=1:m
80         u = j/m;
81         xy(j+1,:) = u^2.*z1 + u.*z2 + z3;
82     end
83     plot(xy(:,1),xy(:,2),"r.-");
84 end
85 hold off
86 end
```