3.2. Построить кубический сплайн для функции, заданной в узлах интерполяции, предполагая, что сплайн имеет нулевую кривизну при $x=x_0$ и $x=x_4$. Вычислить значение функции в точке $x=X^*$.

1	T 7 *		1	_
Ι.	X	=	1	.٦

i	0	1	2	3	4
x_i	0.0	1.0	2.0	3.0	4.0
f_{i}	0.0	0.5	0.86603	1.0	0.86603

2. $X^* = 1.5$

-	••					
	i	0	1	2	3	4
	x_i	0.0	1.0	2.0	3.0	4.0
j	f_i	1.0	0.86603	0.5	0.0	-0.5

3. $X^* = 1.5$

i	0	1	2	3	4
\boldsymbol{x}_{i}	0.0	0.9	1.8	2.7	3.6
f_{i}	0.0	0.36892	0.85408	1.7856	6.3138

4. $X^* = 2.66666667$

i	0	1	2	3	4
x_{i}	1.0	1.9	2.8	3.7	4.6
f_{i}	2.4142	1.0818	0.50953	.11836	-0.24008

5. $X^* = 0.8$

i	0	1	2	3	4
X_i	0.1	0.5	0.9	1.3	1.7
f_{i}	-2.3026	-0.69315	-0.10536	0.26236	0.53063

6. $X^* = -0.5$

i	0	1	2	3	4
x_i	-2.0	-1.0	0.0	1.0	2.0
f_{i}	0.13534	0.36788	1.0	2.7183	7.3891

7. $X^* = 3.0$

i	0	1	2	3	4
x_{i}	0.0	1.7	3.4	5.1	6.8
f_{i}	0.0	1.3038	1.8439	2.2583	2.6077

8. $X^* = 0.1$

i	0	1	2	3	4
X_{i}	-0.4	-0.1	0.2	0.5	0.8
f_{i}	-0.41152	-0.10017	0.20136	0.52360	0.92730

9. $X^* = 0.1$

i	0	1	2	3	4
X_i	-0.4	-0.1	0.2	0.5	0.8
f_{i}	1.9823	1.6710	1.3694	1.0472	0.64350

10. $X^* = -0.5$

	i	0	1	2	3	4
	X_i	-3.0	-1.0	1.0	3.0	5.0
	f_i	-1.2490	-0.78540	0.78540	1.2490	1.3734
11. X*					3,2,3	210.70
11. Λ	i	0	1	2	3	4
	X_i	-3.0	-1.0	1.0	3.0	5.0
	f_i	2.8198	2.3562	0.78540	0.32175	0.19740
12. <i>X</i> *						
12. A	i	0	1	2	3	4
	x_i	0.0	0.5	1.0	1.5	2.0
	f_{i}	0.0	0.97943	1.8415	2.4975	2.9093
13. <i>X</i> *						<u> </u>
	i	0	1	2	3	4
	x_i	0.0	1.0	2.0	3.0	4.0
	f_{i}	1.0	1.5403	1.5839	2.01	3.3464
14. X*						
	i	0	1	2	3	4
	x_{i}	0.0	0.9	1.8	2.7	3.6
	f_{i}	0.0	0.72235	1.5609	2.8459	7.7275
15. <i>X</i> *	=2.66	6666667				
	i	0	1	2	3	4
	\mathcal{X}_{i}	1.0	1.9	2.8	3.7	4.6
	f_{i}	2.8069	1.8279	1.6091	1.5713	1.5663
16. <i>X</i> *	=0.8					
	i	0	1	2	3	4
	\mathcal{X}_{i}	0.1	0.5	0.9	1.3	1.7
	f_{i}	-2.2026	-0.19315	0.79464	1.5624	2.2306
17. <i>X</i> *	=-0.5					
	i	0	1	2	3	4
	\mathcal{X}_{i}	-2.0	-1.0	0.0	1.0	2.0
	f_{i}	-1.8647	-0.63212	1.0	3.7183	9.3891
18. <i>X</i> *					I -	
	i	0	1 7	2	3	4
	X_i	0.0	1.7	3.4	5.1	6.8
	f_i	0.0	3.0038	5.2439	7.3583	9.4077
19. <i>X</i> *			1		2	4
	i	-0.4	-0.1	0.2	0.5	0.8
	X_i					
2 0 == "	f_i	-0.81152	-0.20017	0.40136	1.0236	1.7273
20. <i>X</i> *	=0.1	0	1		2	
		-0.4	-0.1	0.2	0.5	0.8
	X_i	1.5823	1.5710	1.5694	1.5472	1.4435
	f_{i}	1.3043	1.3/10	1.3034	1.34/2	1.4433

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	21. <i>X</i> *	=-0.5					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		i	0	1	2	3	4
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		x_{i}	-3.0	-1.0	1.0	3.0	5.0
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		f_{i}	-4.2490	-1.7854	1.7854	4.2490	6.3734
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	22. X*			I			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $				1	2	3	4
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		x_{i}	-3.0	-1.0	1.0	3.0	5.0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		f_{i}	-0.18016	1.3562	1.7854	3.3218	5.1974
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	23. X*	=0.8			•		
$ \begin{array}{ c c c c c c c c c }\hline f_i & 10.0 & 2.0 & 1.1111 & 0.76923 & 0.58824\\\hline\hline & f_i & 0 & 1 & 2 & 3 & 4\\\hline & i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline & f_i & 100.00 & 4.0 & 1.2346 & 0.59172 & 0.34602\\\hline\hline & 25. & X^* = 0.8\\\hline\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline & f_i & 10.1 & 2.5 & 2.0111 & 2.0692 & 2.2882\\\hline\hline & 26. & X^* = 0.8\\\hline\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline & f_i & 100.01 & 4.2500 & 2.0446 & 2.2817 & 3.2360\\\hline\hline & 27. & X^* = 1.5\\\hline\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.26180 & 0.90690 & 1.5708 & 1.3090\\\hline\hline & 28. & X^* = 1.5\\\hline\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.45345 & 0.52360 & 0.0 & -2.2672\\\hline\hline & 29. & X^* = -0.5\\\hline\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -2.0 & -1.0 & 0.00 & 1.0 & 2.0\\\hline & f_i & -0.27067 & -0.36788 & 0.00 & 2.7183 & 14.778\\\hline\hline & 30. & X^* = -0.5\\\hline\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -1.2 & -0.7 & -0.2 & 0.3 & 0.8\\\hline\hline \end{array}$		i	0	1	2	3	4
$ 24. \ X^* = 0.8 $		x_{i}	0.1	0.5	0.9	1.3	1.7
$ \begin{array}{ c c c c c c c c }\hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7 \\\hline f_i & 100.00 & 4.0 & 1.2346 & 0.59172 & 0.34602 \\\hline \hline $25.$ $X^* = 0.8$ \\\hline \hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7 \\\hline f_i & 10.1 & 2.5 & 2.0111 & 2.0692 & 2.2882 \\\hline \hline $26.$ $X^* = 0.8$ \\\hline \hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7 \\\hline f_i & 100.01 & 4.2500 & 2.0446 & 2.2817 & 3.2360 \\\hline \hline $27.$ $X^* = 1.5$ \\\hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0 \\\hline f_i & 0.0 & 0.26180 & 0.90690 & 1.5708 & 1.3090 \\\hline \hline $28.$ $X^* = 1.5$ \\\hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0 \\\hline f_i & 0.0 & 0.45345 & 0.52360 & 0.0 & -2.2672 \\\hline \hline $29.$ $X^* = -0.5$ \\\hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & -2.0 & -1.0 & 0.00 & 1.0 & 2.0 \\\hline f_i & -0.27067 & -0.36788 & 0.00 & 2.7183 & 14.778 \\\hline \hline $30.$ $X^* = -0.5$ \\\hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & -0.27067 & -0.36788 & 0.00 & 2.7183 & 14.778 \\\hline \hline $30.$ $X^* = -0.5$ \\\hline i & 0 & 1 & 2 & 3 & 4 \\\hline x_i & -1.2 & -0.7 & -0.2 & 0.3 & 0.8 \\\hline \hline \end{tabular}$		f_{i}	10.0	2.0	1.1111	0.76923	0.58824
$\begin{array}{ c c c c c c c c }\hline x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline f_i & 100.00 & 4.0 & 1.2346 & 0.59172 & 0.34602\\\hline 25. & X^* = 0.8\\\hline & & & & & & & & \\\hline & & & & & & & & \\\hline & & & &$	24. X*	=0.8			•		
$\begin{array}{ c c c c c c c c c }\hline f_i & 100.00 & 4.0 & 1.2346 & 0.59172 & 0.34602\\\hline 25. & X^* = 0.8\\\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline & f_i & 10.1 & 2.5 & 2.0111 & 2.0692 & 2.2882\\\hline 26. & X^* = 0.8\\\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline & f_i & 100.01 & 4.2500 & 2.0446 & 2.2817 & 3.2360\\\hline 27. & X^* = 1.5\\\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.26180 & 0.90690 & 1.5708 & 1.3090\\\hline 28. & X^* = 1.5\\\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.45345 & 0.52360 & 0.0 & -2.2672\\\hline 29. & X^* = -0.5\\\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -2.0 & -1.0 & 0.00 & 1.0 & 2.0\\\hline & f_i & -0.27067 & -0.36788 & 0.00 & 2.7183 & 14.778\\\hline 30. & X^* = -0.5\\\hline & i & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -1.2 & -0.7 & -0.2 & 0.3 & 0.8\\\hline \end{array}$		i	0	1	2		
25. $X^* = 0.8$		x_{i}	0.1	0.5	0.9	1.3	1.7
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		f_{i}	100.00	4.0	1.2346	0.59172	0.34602
$\begin{array}{ c c c c c c c c }\hline x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline f_i & 10.1 & 2.5 & 2.0111 & 2.0692 & 2.2882\\\hline 26. & X^* = 0.8\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline & f_i & 100.01 & 4.2500 & 2.0446 & 2.2817 & 3.2360\\\hline 27. & X^* = 1.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.26180 & 0.90690 & 1.5708 & 1.3090\\\hline 28. & X^* = 1.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.45345 & 0.52360 & 0.0 & -2.2672\\\hline 29. & X^* = -0.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -2.0 & -1.0 & 0.00 & 1.0 & 2.0\\\hline & f_i & -0.27067 & -0.36788 & 0.00 & 2.7183 & 14.778\\\hline 30. & X^* = -0.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -1.2 & -0.7 & -0.2 & 0.3 & 0.8\\\hline \end{array}$	25. X*	=0.8		1			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		i	0	1	2		
26. $X^* = 0.8$		x_i	0.1	0.5	0.9	1.3	1.7
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		f_{i}	10.1	2.5	2.0111	2.0692	2.2882
$\begin{array}{ c c c c c c c c c }\hline x_i & 0.1 & 0.5 & 0.9 & 1.3 & 1.7\\\hline f_i & 100.01 & 4.2500 & 2.0446 & 2.2817 & 3.2360\\\hline \hline 27. & X^* = 1.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.26180 & 0.90690 & 1.5708 & 1.3090\\\hline 28. & X^* = 1.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & 0.0 & 1.0 & 2.0 & 3.0 & 5.0\\\hline & f_i & 0.0 & 0.45345 & 0.52360 & 0.0 & -2.2672\\\hline 29. & X^* = -0.5\\\hline & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -2.0 & -1.0 & 0.00 & 1.0 & 2.0\\\hline & f_i & -0.27067 & -0.36788 & 0.00 & 2.7183 & 14.778\\\hline \hline & 30. & X^* = -0.5\\\hline & & & 0 & 1 & 2 & 3 & 4\\\hline & x_i & -1.2 & -0.7 & -0.2 & 0.3 & 0.8\\\hline \end{array}$	26. X*	=0.8					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		i	0	1	2		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		x_{i}	0.1	0.5	0.9	1.3	1.7
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		f_{i}	100.01	4.2500	2.0446	2.2817	3.2360
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	27. <i>X</i> *	=1.5					
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		i	0	1	2		4
28. $X^* = 1.5$		x_{i}	0.0	1.0	2.0	3.0	5.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		f_{i}	0.0	0.26180	0.90690	1.5708	1.3090
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	28. X*	=1.5					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		i	0	•	-		
29. $X^* = -0.5$ $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		x_{i}	0.0	1.0	2.0	3.0	5.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		f_{i}	0.0	0.45345	0.52360	0.0	-2.2672
$ x_i $	29. <i>X</i> *	=-0.5					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		i		1			
30. $X^* = -0.5$ $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		x_{i}	-2.0	-1.0	0.00	1.0	2.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		f_{i}	-0.27067	-0.36788	0.00	2.7183	14.778
<i>x</i> _i -1.2 -0.7 -0.2 0.3 0.8	30. <i>X</i> *	=-0.5					
·		i					
f_i 0.43372 0.24333 0.32749E-01 0.12149 1.4243		X_i	-1.2	-0.7	-0.2	0.3	0.8
		$\overline{f_i}$	0.43372	0.24333	0.32749E-0	0.12149	1.4243