

Table 22.3

Coefficients for the Chebyshev Polynomials  $T_n(x)$  and for  $x^n$  in terms of  $T_m(x)$

$$T_n(x) = \sum_{m=0}^n c_m x^m \qquad x^n = b_n^{-1} \sum_{m=0}^n d_m T_m(x)$$

	$x^0$	$x^1$	$x^2$	$x^3$	$x^4$	$x^5$	$x^6$	$x^7$	$x^8$	$x^9$	$x^{10}$	$x^{11}$	$x^{12}$		
$b_n$	1	1	2	4	8	16	32	64	128	256	512	1024	2048		
$T_0$	1	1		1		3		10		35		126		462	$T_0$
$T_1$		1	1		3		10		35		126		462		$T_1$
$T_2$	-1		2	1		4		15		56		210		792	$T_2$
$T_3$		-3		4	1		5		21		84		330		$T_3$
$T_4$	1		-8		8	1		6		28		120		495	$T_4$
$T_5$		5		-20		16	1		7		36		165		$T_5$
$T_6$	-1		18		-48		32	1		8		45		220	$T_6$
$T_7$		-7		56		-112		64	1		9		55		$T_7$
$T_8$	1		-32		160		-256		128	1		10		66	$T_8$
$T_9$		9		-120		432		-576		256	1		11		$T_9$
$T_{10}$	-1		50		-400		1120		-1280		512	1		12	$T_{10}$
$T_{11}$		-11		220		-1232		2816		-2816		1024	1		$T_{11}$
$T_{12}$	1		-72		840		-3584		6912		-6144		2048	1	$T_{12}$
	$x^0$	$x^1$	$x^2$	$x^3$	$x^4$	$x^5$	$x^6$	$x^7$	$x^8$	$x^9$	$x^{10}$	$x^{11}$	$x^{12}$		

$$T_6(x) = 32x^6 - 48x^4 + 18x^2 - 1 \qquad x^6 = \frac{1}{32} [10T_0 + 15T_2 + 6T_4 + T_6]$$

Chebyshev Polynomials  $T_n(x)$

Table 22.4

$n \setminus x$	0.2	0.4	0.6	0.8	1.0
0	+1.00000 00000	+1.00000 00000	+1.00000 00000	+1.00000 00000	1
1	+0.20000 00000	+0.40000 00000	+0.60000 00000	+0.80000 00000	1
2	-0.92000 00000	-0.68000 00000	-0.28000 00000	+0.28000 00000	1
3	-0.56800 00000	-0.94400 00000	-0.93600 00000	-0.35200 00000	1
4	+0.69280 00000	-0.07520 00000	-0.84320 00000	-0.84320 00000	1
5	+0.84512 00000	+0.88384 00000	-0.07584 00000	-0.99712 00000	1
6	-0.35475 20000	+0.78227 20000	+0.75219 20000	-0.75219 20000	1
7	-0.98702 08000	-0.25802 24000	+0.97847 04000	-0.20638 72000	1
8	-0.04005 63200	-0.98868 99200	+0.42197 24800	+0.42197 24800	1
9	+0.97099 82720	-0.53292 95360	-0.47210 34240	+0.88154 31680	1
10	+0.42845 56288	+0.56234 62912	-0.98849 65888	+0.98849 65888	1
11	-0.79961 60205	+0.98280 65690	-0.71409 24826	+0.70005 13741	1
12	-0.74830 20370	+0.22389 89640	+0.13158 56097	+0.13158 56097	1