

Table 4.7 Table of erf(x) values for Problem 9.

x	erf(x)
0.0	0.00000000000000
0.1	0.11246291601828
0.2	0.22270258921048
0.3	0.32862675945913
0.4	0.42839235504667
0.5	0.52049987781305
0.6	0.60385609084793
0.7	0.67780119383742
0.8	0.74210096470766
0.9	0.79690821242283
1.0	0.84270079294971

- (a) Construct the quadratic interpolating polynomial to the error function using the data at the nodes $x_0 = 0$, $x_1 = 0.5$, and $x_2 = 1.0$. Plot the polynomial and the data in the table and comment on the observed accuracy.
- (b) Repeat the above, but this time construct the cubic interpolating polynomial using the nodes $x_0 = 0.0$, $x_2 = 0.3$, $x_2 = 0.7$, and $x_3 = 1.0$.
10. The gamma function, denoted by $\Gamma(x)$, is an important special function in probability, combinatorics, and other areas of applied mathematics. Because it can be shown that $\Gamma(n + 1) = n!$, the gamma function is considered a generalization of the factorial function to non-integer arguments. Table 4.8 gives the values of $\Gamma(x)$ on the interval $[1, 2]$. Use these to construct the fifth degree polynomial based on the nodes $x = 1, 1.2, 1.4, 1.6, 1.8, 2.0$, and then use this polynomial to estimate the values at $x = 1.1, 1.3, 1.5, 1.7, 1.9$. Plot your polynomial and compare it to the intrinsic gamma function on your computing system or calculator.

Table 4.8 Table of $\Gamma(x)$ values.

x	$\Gamma(x)$
1.00	1.0000000000
1.10	0.9513507699
1.20	0.9181687424
1.30	0.8974706963
1.40	0.8872638175
1.50	0.8862269255
1.60	0.8935153493
1.70	0.9086387329
1.80	0.9313837710
1.90	0.9617658319
2.00	1.0000000000

11. The data below Use Newton in quadratic inter 600 K? (See T

Temperature (
Conductivity (

12. As steam is he range [220, 300 in Table 4.10.⁶

Table

T	220	2
P	17.188	20

- (a) Construct 220, $T_1 =$ and comm
- (b) Repeat the using the 1
- (c) Which of $P(T)$ that
13. Similar data for

Table 4.11

T	0	5
P	30.42	34.7

- (a) Construct t 0, $T_1 = 20$ comment c
- (b) Repeat the using the n
- (c) Which of t $P(T)$ that :

⁶Taken from tables in *Intro* John Wiley & Sons, Inc., Ne