$$I_g = \frac{b-a}{2}\,[w_1 g(z_1) + w_2 g(z_2)]$$

$$x = \frac{b-a}{2}\,z + \frac{b+a}{2} = 2z$$

Therefore,

$$g(z) = e^{-2z/2} = e^{-z}$$

For a two-point formula

$$w_1 = w_2 = 1$$

$$z_1 = -\frac{1}{\sqrt{3}}$$

$$z_2 = \frac{1}{\sqrt{3}}$$

Upon substitution of these values, we get

$$\begin{aligned} I_g &= 2\,[\exp(-1/\sqrt{3}) + \exp(1/\sqrt{3})] \\ &= 4.6853922 \end{aligned}$$

Higher-Order Gaussian Formulae

By using a procedure similar to the one applied in deriving two-point formula, we can obtain the parameters w_i and z_i for higher-order versions of Gaussian quadrature. These parameters for formulae up to an order of six are tabulated in Table 12.2.

Table 12.2 Parameters for Gaussian Integration

n	i	w_i	z_i
2	1	1.00000	− 0.57735
	2	1.00000	0.57735
3	1	0.55556	− 0.77460
	2	0.88889	0.00000
	3	0.55556	− 0.77460
4	1	0.34785	− 0.86114
	2	0.65215	− 0.33998
	3	0.65215	+ 0.33998
	4	0.34785	0.86114
5	1	0.23693	− 0.90618
	2	0.47863	− 0.53847
	3	0.56889	0.00000
	4	0.47863	0.53847
	5	0.23693	0.90618