Gaussian quadrature on the interval $[-1,1]$

The formula for n-point Gaussian quadrature on the integral $[-1,1]$ is

$$\int_{-1}^{1} f(x)dx \approx \sum_{i=1}^{n} w_i f(x_i)$$

The nodes x_i and weights w_i are as follows (for $n=1$ to $n=10$):

	nodes	weights
$n=1$	0	2
$n=2$	$\pm\frac{1}{\sqrt{3}} \approx \pm 0.57735026918962576451$	1
$n=3$	0	$\frac{8}{9} \approx 0.88888888888888888889$
	$\pm\sqrt{\frac{3}{5}} \approx \pm 0.77459666924148337704$	$\frac{5}{9} \approx 0.55555555555555555555$
$n=4$	$\pm 0.86113631159405257522$	0.34785484513745385740
	$\pm 0.33998104358485626480$	0.65214515486254614263
$n=5$	0	0.56888888888888888893
	$\pm 0.90617984593866399280$	0.23692688505618908753
	$\pm 0.53846931010568309104$	0.47862867049936646804
$n=6$	$\pm 0.93246951420315202781$	0.17132449237917034507
	$\pm 0.66120938646626451366$	0.36076157304813860737
	$\pm 0.23861918608319690863$	0.46791393457269104710
$n=7$	0	0.41795918367346938778
	$\pm 0.94910791234275852453$	0.12948496616886969318
	$\pm 0.74153118559939443986$	0.27970539148927666759
	$\pm 0.40584515137739716691$	0.38183005050511894501
$n=8$	$\pm 0.96028985649753623168$	0.10122853629037625921
	$\pm 0.79666647741362673959$	0.22238103445337447037
	$\pm 0.52553240991632898582$	0.31370664587788728607
	$\pm 0.18343464249564980494$	0.36268378337836198310
$n=9$	0	0.33023935500125976262
	$\pm 0.96816023950762608984$	0.081274388361574412084
	$\pm 0.83603110732663579430$	0.18064816069485740439
	$\pm 0.61337143270059039731$	0.26061069640293546254
	$\pm 0.32425342340380892904$	0.31234707704000283693
$n=10$	$\pm 0.97390652851717172008$	0.066671344308688137179
	$\pm 0.86506336668898451073$	0.14945134915058059038
	$\pm 0.67940956829902440623$	0.21908636251598204295
	$\pm 0.43339539412924719080$	0.26926671930999634918
	$\pm 0.14887433898163121088$	0.29552422471475286217

Note: To do an integral on a different interval $[a,b]$, do the change of variable

$$y = \frac{2x-a-b}{b-a}$$

This gives

$$\int_a^b g(x)dx = \frac{b-a}{2}\int_{-1}^{1} g\left(\frac{(b-a)y+(a+b)}{2}\right) dy$$