

The approximate formula for each n:

$$\left(\frac{r}{L}\right)_{optimum} \cong \frac{1}{6n+1} \text{ with approximate Tolerance} = 0.002$$

n	r/L	r/L as a fraction	Using approximate Formula	ΔPE	ΔPE using $\left(\frac{r}{L}\right)_{optimum}$ approximate formula
1	0.143080750251166	$\frac{64}{447}$	0.14285	-3329.190	-3329.04
2	0.0792985982485324	$\frac{5}{63}$	0.076923	-924.489	-916.396
3	0.0548180139054166	$\frac{4}{73}$	0.05263	-425.736	-420.001
4	0.0418743629670565	$\frac{6}{143}$	0.04	-243.734	-239.866
5	0.0338717159010935	$\frac{2}{59}$	0.03225	-157.637	-154.882
6	0.0284352	$\frac{4}{141}$	0.02703	-110.236	-108.23
7	0.0245018	$\frac{3}{122}$	0.02326	-81.393	-79.861
8	0.0215241	$\frac{2}{93}$	0.02041	-62.548	-61.335
9	0.0191915	$\frac{1}{52}$	0.01818	-49.563	-48.576
10	0.0173149	$\frac{1}{58}$	0.01639	-40.238	-39.422

Note: for all the calculations L =1, and assuming a=s to get the maximum

