[a,b] = [1,0]

n	T	eh	e2h/eh
1	0.48986796623791	0.35985835918259	
2	0.71994619685185	0.12978012856865	0.36064225064397
4	0.80348570533171	0.04624062008879	0.35629969394216
8	0.83334214565712	0.01638417976338	0.35432439556228
16	0.84393436795018	0.00579195747032	0.35350915053191
32	0.84768044676220	0.00204587865830	0.35322750016539
64	0.84900377084043	0.00072255458007	0.35317567693285
128	0.84947111004251	0.00025521537799	0.35321259463560

[a,b] = [π/4, 9π/4]

n	T	eh	e2h/eh
1	0.00000000000000	1.27323954473516	
2	1.13843429252224	0.13480525221292	0.10587579750436
4	-1.26124388523432	0.01199565950084	0.08898510483771
8	-1.27232970400346	0.00090984073170	0.07584749564093
16	-1.27317790925396	0.00006163548120	0.06774315443652
32	-1.27323559135119	0.00000395338397	0.06414136619375
64	-1.27323929588531	0.00000024884985	0.06294603608860
128	-1.27323952915360	0.00000001558156	0.06261430351871

[a,b] = [π, 2π]

n	T	eh	e2h/eh
1	-1.51409455798888	0.34646544201112	
2	-1.77624020205602	0.08431979794398	0.24337145273286
4	-1.83963706667647	0.02092293332353	0.24813784939844
8	-1.85533630955249	0.00522369044751	0.24966338929329
16	-1.85925141520278	0.00130858479722	0.25050963688781
32	-1.86022957934930	0.00033042065070	0.25250228445412
64	-1.86047408202777	0.00008591797223	0.26002603665323
128	-1.86053520529857	0.00002479470143	0.28858573807671

All T values computed in MATLAB