

Find the value of $f'(x)$ given $f(x)=2e^{1.5x}$ using the central divided difference scheme. Show the absolute relative approximate error, absolute relative true error and true error. Illustrate the concept of the true error being of the order of square of step size.

f = 2 * Exp(1.5 * x)	
Initial Step size	0.1
x	3
Exact Value f(3)	270.05139390

Central Divided Difference											
x	h	f(x)	Approximate Error	Absolute Relative Approximate Error in Percentage	Number of Significant Digits Correct	Absolute Relative True Error in Percentage	True Error		First Term of Error	Rest of the Error Terms	Error/(deltax^2)
3	0.1000000000	271.0652				0.3754	-1.01383262		-1.01269273	-0.00113989	-101.38326170
3	0.0500000000	270.3046	-0.7606	0.2814	2	0.0938	-0.25324440		-0.25317318	-0.00007121	-101.29775851
3	0.0250000000	270.1147	-0.1899	0.0703	2	0.0234	-0.06329775		-0.06329330	-0.00000445	-101.27639344
3	0.0125000000	270.0672	-0.0475	0.0176	3	0.0059	-0.01582360		-0.01582332	-0.00000028	-101.27105291
3	0.0062500000	270.0553	-0.0119	0.0044	4	0.0015	-0.00395585		-0.00395583	-0.00000002	-101.26971802
3	0.0031250000	270.0524	-0.0030	0.0011	4	0.0004	-0.00098896		-0.00098896	0.00000000	-101.26937991