

A table for forward, backward and central divided difference example

$$f(x) = 2 * \exp(1.5 * x)$$

Initial Step

size 0.1

x 3

Exact

Value $f'(3)$ 270.05139390

Forward 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
3	0.1000000000	291.3571				7.8895	-21.3057
3	0.0500000000	280.4363	-10.9208	3.8942	1	3.8455	-10.3849
3	0.0250000000	275.1787	-5.2576	1.9106	1	1.8987	-5.1274
3	0.0125000000	272.5990	-2.5797	0.9463	1	0.9434	-2.5476
3	0.0062500000	271.3212	-1.2778	0.4710	2	0.4702	-1.2698
3	0.0031250000	270.6853	-0.6359	0.2349	2	0.2347	-0.6339

Backward 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
3	0.1000000000	250.7734				7.1387	19.2780
3	0.0500000000	260.1730	9.3996	3.6128	1	3.6580	9.8784
3	0.0250000000	265.0506	4.8777	1.8403	1	1.8518	5.0008
3	0.0125000000	267.5354	2.4848	0.9288	1	0.9317	2.5160
3	0.0062500000	268.7895	1.2541	0.4666	2	0.4673	1.2619
3	0.0031250000	269.4194	0.6300	0.2338	2	0.2340	0.6319

