#nm-integrate

Target	n	-midpoint	-trapezium	-simpsons	-simpsons-38
$\pi \approx 3.14159265$	1	3.2	3	3.133333	3.234615
	2	3.162353	3.1	3.141569	3.164124
	4	3.146801	3.131176	3.141593	3.147017
	8	3.142895	3.138988	3.141593	3.142922
$\ln 2 \approx 0.69314718$	1	0.666667	0.75	0.694444	0.70625
	2	0.685714	0.708333	0.693254	0.696036
	4	0.69122	0.697024	0.693155	0.69383
	8	0.692661	0.694122	0.693148	0.693314

#nm-differentiate

Target	h	-forward	-central
$f(x) = \cos x, \quad f`(\frac{\pi}{2}) = -1$	1	−0.841471	−0.958851
	0.1	−0.998334	−0.999583
	0.01	−0.999983	−0.999996
$f(x) = \frac{1}{1+\ln x}, \quad f`(2) \approx -0.174414$	1	−0.114111	−0.189667
	0.1	−0.165426	−0.174553
	0.01	−0.173468	−0.174415

#nm-iterate

-FPI and -relaxed-FPI

Target	-FPI	-relaxed-FPI $\lambda = 0.5$	-relaxed-FPI $\lambda = 1.4$
$g(x) = 2\sin x + 2\cos x$ $x \approx -2.68075641016$	-2.603732	-2.680753	-2.8662

All Values:

n	-FPI x_n	-relaxed-FPI, $\lambda = 0.5$	-relaxed-FPI, $\lambda = 1.4$
0	-1.5	-1.5	-1.5
1	-1.853516	-1.676758	-1.676758
2	-2.478537	-1.938534	-1.938534
3	-2.807286	-2.261915	-2.261915
4	-2.545505	-2.53889	-2.53889
5	-2.777895	-2.660123	-2.660123
6	-2.58064	-2.679459	-2.679459
7	-2.757483	-2.680692	-2.680692
8	-2.603732	-2.680753	-2.680753

-newton-raphson

Finding Roots:

Target	-newton-raphson
$f(x) = e^x - x - 2$ $f(1.14619) \approx 0$ $f(-1.84141) \approx 9$	1.146193 -1.841406

All Values:

n	NR:$x_0 = 1$	NR:$x_0 = -1$
0	1	-1
1	1.163953	-1.999999
2	1.146421	-1.843482
3	1.146193	-1.841406
4	1.146193	-1.841406
5	1.146193	-1.841406

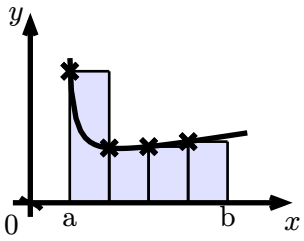
-secant, -false-position, -bisection for $\sin(x) = 0$

x	-secant	-false-position	-bisection
$[-1, 1]$	`(-1, 1, 0.0, -0.0, 0)`	`((-1, 1), (0.0, 1), (0.0, 1), (0.0, 1), (0.0, 1))`	`((-1, 1), (-1, 0.0))`
$[0.5, 1]$	`(0.5, 1, -0.16210685, 0.0249181, -9.259e-5)`	False Position should panic.	Bisection should panic.
$[-1.5, 1]$	`(-1.5, 1, -0.14394583, 0.02266478, -6.607e-5)`	`( (-1.5, 1), (-1.5, -0.14394583), (0.08382294, -0.14394583), (-0.00012106, -0.14394583), (4.2e-7, -0.14394583), )`	`( (-1.5, 1), (-1.5, -0.25), (-1.5, -0.875), (-1.5, -1.1875), (-1.5, -1.34375), )`

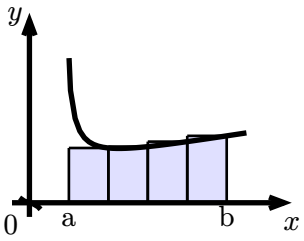
nm-plot-integral

Alternatively including ‘points’

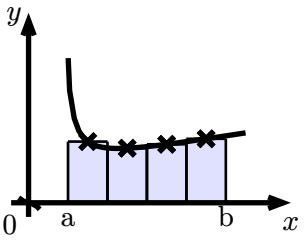
“left”:



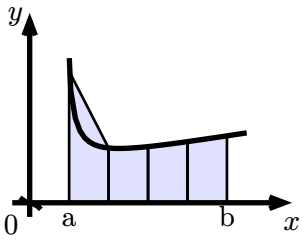
“right”:



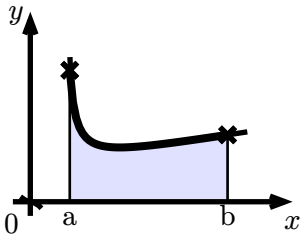
“mid”:



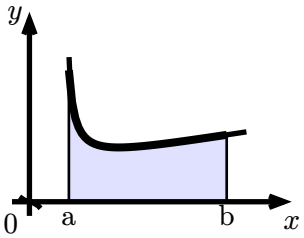
“trapezium”:



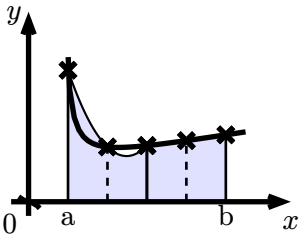
“integral”:



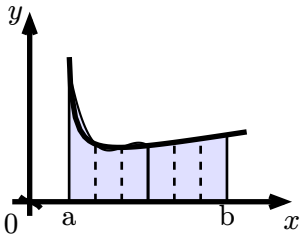
“asfsf”:



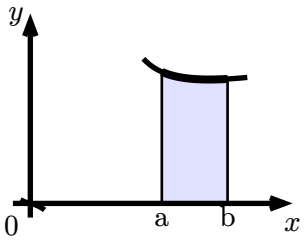
“simpsons”:

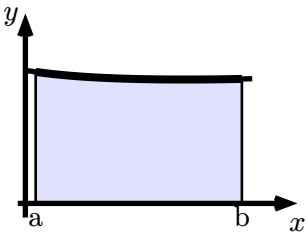


“simpsons-38”:

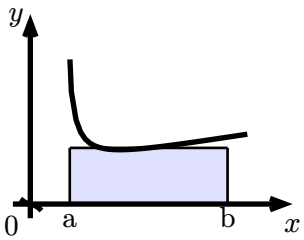


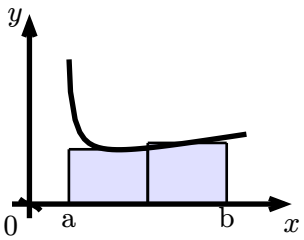
Limits: inc-0: true, inc-0: false

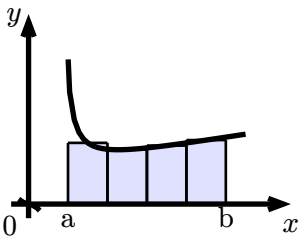


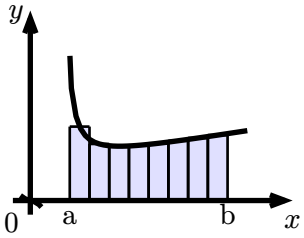


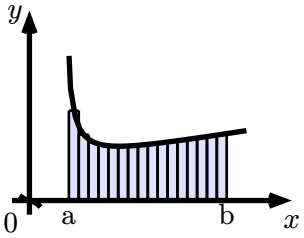
n-strips: 1, 2, 4, 8, 16, 32

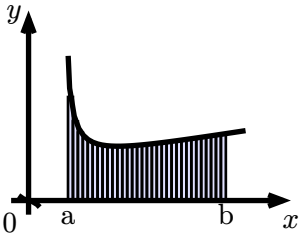












#nm-table

Integral Table, -integrate

method: “Midpoint”

n	M_n	Difference	Ratio
1	0.99749		
2	0.96649	−0.031	
4	0.95894	−0.00755	0.24355
8	0.95707	−0.00187	0.24768
16	0.9566	−0.00047	0.25134

method: “Trapezium”

n	T_n	Difference	Ratio
1	0.87538		
2	0.93644	0.06106	
4	0.95146	0.01502	0.24599
8	0.9552	0.00374	0.249
16	0.95614	0.00094	0.25134

method: Simpsons“

n	S_{2n}	Difference	Ratio
1	0.95679		
2	0.95647	−0.00032	
4	0.95645	−0.00002	0.0625
8	0.95645	0	0

method: “Simpsons-38”

n	S_{3n}	Difference	Ratio
1	0.96736		
2	0.95999	−0.00737	
4	0.95743	−0.00256	0.34735
8	0.95671	−0.00072	0.28125
16	0.95652	−0.00019	0.26389

Differential Table, -differentiate

method:“CD”

h	$f'(x)$	Difference	Ratio
1	0.51083		
0.5	0.50263	−0.0082	
0.25	0.50065	−0.00198	0.24146
0.125	0.50016	−0.00049	0.24747
0.0625	0.50004	−0.00012	0.2449

method:“FD”

h	$f'(x)$	Difference	Ratio
1	0.40547		
0.5	0.44629	0.04082	
0.25	0.47113	0.02484	0.60853
0.125	0.485	0.01387	0.55837
0.0625	0.49235	0.00735	0.52992

Iteration Table, -iterate

method: “FPI”

n	x_n	Difference	Ratio
1	1		
2	0.84147	−0.15853	
3	0.74562	−0.09585	0.60462
4	0.67843	−0.06719	0.70099
5	0.62757	−0.05086	0.75696

method: “RFPI”

n	x_n	Difference	Ratio
1	1		
2	0.92074	−0.07926	
3	0.85839	−0.06235	0.78665
4	0.80759	−0.0508	0.81476
5	0.76511	−0.04248	0.83622

method: “Newton-Raphson”

n	x_n	Difference	Ratio
1	1		
2	−0.5574	−1.5574	
3	0.06594	0.62334	0.25699
4	−0.0001	−0.06604	0.16996

method: “Secant”

n	x_n	Difference	Ratio
1	1		
2	0.5	−0.5	
3	−0.16211	−0.66211	2.00714
4	0.00465	0.16676	0.32255

n	x_n	Difference	Ratio
5	0	0.0001	0.02293

n	x_n	Difference	Ratio
5	−0.00002	−0.00467	0.08203