Ay190 – Worksheet 03
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Note: the formatting is messed up in this but all the work is done!

1 Integration via Newton-Cotes Formulae

Figure 1 shows the convergence of the absolute error as a function of step size of the Midpoint, Trapezoid and Simpsons numerical integration methods for the function $f(x) = sin(x)$, while Figure 2 shows the same for the function $f(x) = x \times sin(x)$. In both cases, it is quote clear that while the Midpoint and Trapezoid methods converge at the same rate, Simpson's integration method converges much faster.

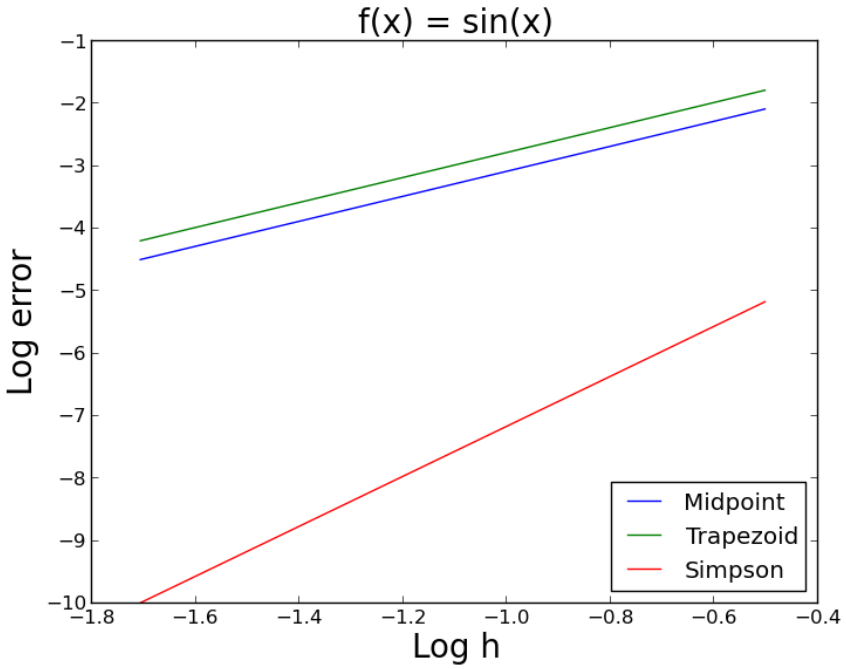

Figure 1: Error as a function of step size for the three numerical integration methods when integreating the function $f(x) = sin(x)$.

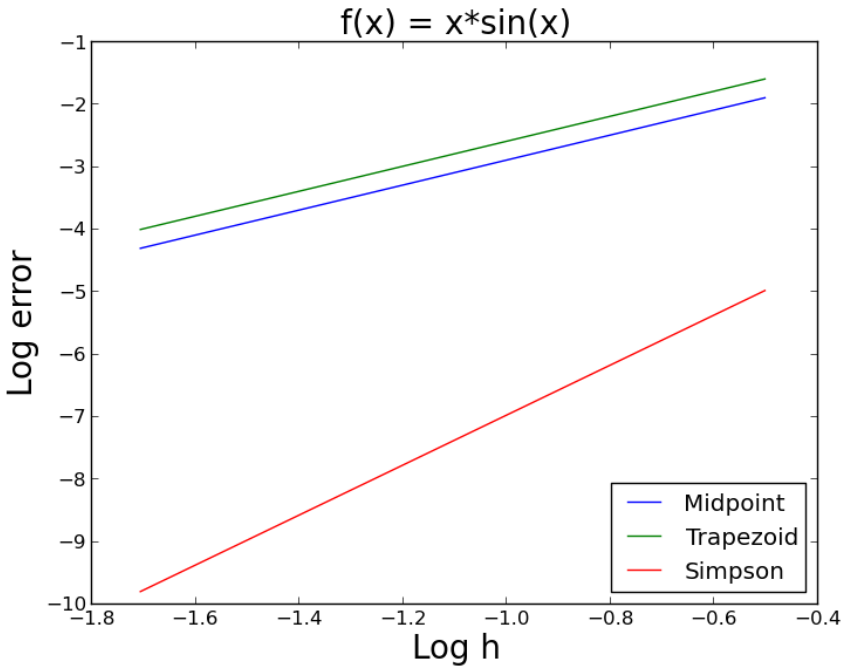

Figure 2: Error as a function of step size for the three numerical integration methods when integreating the function $f(x) = x \times sin(x)$.

2 Gaussian Quadrature