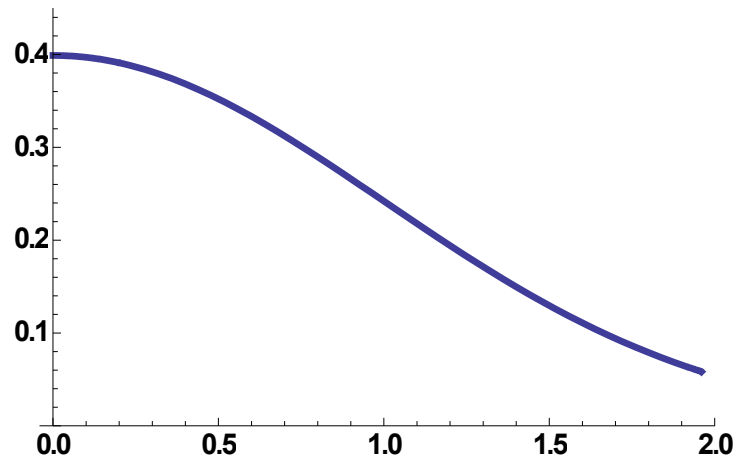# Exercises-Interpolation

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1.  Consider the function

$$f(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}x^2}$$

and the integral

$$F(1.96) = \int_0^{1.96} f(z)dz \approx 0.47500.$$



a.  Approximate the integral using the Trapezium rule and 1 interval.
b.  Approximate the integral using the Trapezium rule and 2 subintervals.
c.  Approximate the integral using the Trapezium rule and 4 subintervals.


2.  Consider the same function and integral as in question 1.
a.  Determine the Lagrange quadratic polynomial based on $x \in \{0, 0.98, 1.96\}$.
b.  Approximate the integral using the quadratic Lagrange polynomial.
c.  Verify Simpson's $\frac{1}{3}$-rule using only 1 interval.