

1. Let $f(x) = e^{-x^2}$.

(a) Use the midpoint rule to estimate $\int_0^2 f(x) dx$ with $n = 20$ and $n = 50$ subintervals.

(b) Use the trapezoid rule to estimate $\int_0^2 f(x) dx$ with $n = 20$ and $n = 50$ subintervals.

(c) Find the maximum value of $|f''(x)|$ on the interval $[0, 2]$.

(d) Find the error estimates for M_{50} and T_{50} . Use these to give an interval inside which the exact value of $\int_0^2 f(x) dx$ must lie.

2. Repeat the steps above with $f(x) = \cos(x^2) dx$.