

Due **Tuesday** Feb 6, at the start of the recitation.

It is **very** important that you clearly show what you are doing and that what you write makes sense and follows proper mathematical form. A correct answer poorly explained will not get full marks.

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- (a) How many subintervals must you use in Simpson's rule to find $\int_0^\pi \sin(x^2) dx$ to 10 digits accuracy, that is, with an error less than $\frac{1}{2} \cdot 10^{-10}$.

You may use, without justification, the fact that, if $f(x) = \sin(x^2)$, then $|f^{(4)}(x)| \leq 1200$ for $x \in [0, \pi]$.

- (b) Evaluate $\int_0^\infty \frac{2}{x^2+4x+3} dx$.

Hint: use properties of logarithms to simplify the definite integral and remember that \ln is a continuous function.