

THE UNIVERSITY OF AKRON
Department of Mathematics

Numerical Integration
Using JavaScript

D. P. Story

© 2001 dpstory@uakron.edu

Last Revision Date: March 3, 2001

Version 1.0

1. Instructions

- Use `*` to indicate multiplication: Type `4*x` for $4x$;
- Use `^` to indicate powers: Type `4*x^3` for $4x^3$; `12*x^-6` for $12x^{-6}$.
- Use parentheses to delimit the argument of a function; i.e., type `sin(x)` rather than `sin x`.
- Use parentheses to define the *scope* of an operation: For example, type `4*x*(x^2+1)^3` for $4x(x^2 + 1)^3$; `4^(2*x+1)` for 4^{2x+1} ; `(sin(x))^2` for $(\sin(x))^2$. *Do not* type `sin^2(x)` for $\sin^2(x)$, type `(sin(x))^2` instead.
- Do *not* use brackets `[]` or braces `{ }`, use only parentheses to delimit a mathematics expression.
- Functions you may use:
 - Trig: `sin`, `cos`, `tan`, `cot`, `sec`, `csc`;

- Inverse Trig: `asin`, `acos`, `atan`;
- Log/exponential: `ln` (natural log), or use `log`; `exp`, the natural exponential; **Note:** You can also enter the natural exponential `exp(x)` as `e^x` for e^x .
- Misc.: `sqrt`, usage `sqrt(x)` for \sqrt{x} (or, use exponential notation: `x^(1/2)`).

When you enter your response, some attempt will be made to determine whether the response is a valid one. For example, if you say `san(x)`, the function 'san' will not be recognized as a valid mathematical function; an error message is generated, and the user is not penalized for a possible typing error. The JavaScript routines will also check for unbalanced parentheses; thus, `((x^4+1) + sin(x)^2` will be flagged as a syntax error.

Important: The only variable used is `x`; do not enter any other undefined symbols into your answer.

▶ ▶ ▶ Turn to next page, please. ▶ ▶ ▶ ▶

Numerical Integration
Trapezoidal Rule and Simpson's Rule

$$\int \quad dx =$$

$n =$

Trapezoidal Results:

Simpson Results:

Precision: