Computational Homework 2, due Nov. 24th

Write a program **simpson(f(x),a,b,n)** to calculate $\int_a^b f(x)\,dx$ using Simpson's rule (composite) with $n = 2, 2^2, 2^3, 2^4, 2^5$ equal intervals.

Test the code on the following functions:

1.
$$\int_0^\pi \sin x\, dx$$

2.
$$\int_0^1 \exp x\, dx$$

3.
$$\int_0^1 \arctan x\, dx$$

Calculate the actual errors for each n for all three functions. Compare the errors at each n and give a brief discussion.

Note: When $n = 2$ (2 equal intervals), this is equivalent to one Simpson's rule on $[a, b]$ involving points $a = x_0$, x_1, $x_2 = b$. When $n = 4$ (4 equal intervals), this is equivalent to two Simpson's rule: one on $[a = x_0, x_2]$ and the other on $[x_2, x_4 = b]$ involving points $a = x_0$, x_1, x_2, x_3, $x_4 = b$.