Name: _____

Numerical Integration

1. Approximate $I = \int_{-1}^{1} f(x)\, dx$ using the Simpson rule $S_n(f)$

2. Use Fundamental Theorem of Calculus to find the true value I and compute the error $E_n^T(f) = I - T_n(f)$.

Perform the above tasks for the choices of monomials $f(x) = x^p$, $p = 0, 1, 2, 3$ and with $n = 2, 3$.
<u>Note</u> If $E_n^T(f) = 0$, then the integration rule $T_n(f)$ is said to be exact.