Recap for Today

- The error introduced by L_n and R_n when approximating $\int_a^b f(x)\,dx$ is related to the magnitude of $f'(x)$ on $[a, b]$.
- If f is monotone on $[a, b]$, it's usually easiest to use Theorem 1 for the error bounds.
- If f is not monotone, then we can use Theorem 2.

1. Let $I = \int_0^{\pi} \sin(x^2)\ dx$.
   (a) How close will L_{500} approximate I? R_{500}?
   (b) Use L_n to approximate I within 0.001 of its actual value.
2. Let $I = \int_{-1}^{2} -2\ln(1+x^2)\ dx$.
   (a) How close will L_{500} approximate I?
   (b) Use R_n to approximate I within 0.001 of its actual value.