Practice

1. **Review** L’Hopital’s Rule in Section 4.7 and the online notes. More interesting ones have the form $0 \cdot \infty$, $0^0$, $\infty^0$, $1^\infty$, and $\infty - \infty$.
   a) **Read** all of 7.7 on improper integrals which we continue to discuss next time.

   b) Interesting ones of the form $0 \cdot \infty$, $0^0$, $\infty^0$, $1^\infty$, and $\infty - \infty$. Page 290–291 #31, 33, 37, 39, 45, 47.

Hand

These should be quick. Some are WeBWorK problems. Potential answers: $k$, $k^2$, 0, 1, 2, 1/2, 1/4, ln 2, ln 3, $e^2$, $e^{-2}$, diverges, $e$.

0. Start WeBWorK Day27—many of these are the same as the hand in problems—and finish Day26.

1. Evaluate these limits using L’Hôpital’s Rule when appropriate. In part (b), $k$ is a non-zero constant. Use correct limit notation.
   a) \[
   \lim_{x \to 0^+} x^2 \ln x \text{ WeBWorK}
   \]
   b) \[
   \lim_{x \to \infty} x \tan (\frac{1}{x}) \text{ WeBWorK}
   \]
   c) \[
   \lim_{x \to \infty} \left(1 - \frac{2}{x}\right)^x \text{ WeBWorK}
   \]
   d) \[
   \lim_{x \to 0^+} \frac{\sin kx}{\arcsin x} \text{ WeBWorK}
   \]
   e) \[
   \lim_{x \to 0^+} x^3 \text{ WeBWorK}
   \]
   f) \[
   \lim_{x \to \infty} \ln(2x - 2) - \ln(x + 7) \text{ WeBWorK}
   \]

2. Page 510 #6. Use correct limit notation. Similar to a WeBWorK problem.

3. Page 510 #8. Use correct limit notation. Similar to a WeBWorK problem.

4. Determine \[
\int_0^{\infty} 2xe^{-x^2} \, dx \text{. Use correct limit notation.}
\]


6. **BONUS** Determine \[
\lim_{x \to 0^+} (\tan x)^x \text{. Hint: Use the "log process." After applying L'Hôpital's Rule the first time, simplify and apply again. (Also a WeBWorK problem.)}
\]