Math 131 Day 27

My Office Hours: M & W 12:30–2:00, Tu 2:30–4:00, & F 1:15-2:30 or by appointment. **Math Intern** Sun: 12–6pm; M 3-10pm; Tu 2–6, 7–1pm; W and Th: 5-10 pm in Lansing 310. Website: `http://math.hws.edu/~mitchell/Math131S13/index.html`.

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, ∞^0, 1^∞, and $\infty - \infty$.

a) **Read** all of 7.7 on improper integrals which we continue to discuss next time.

2. **a)** Suggested last time. Try page 576ff #3, 5, 9–15 (odd), 19–29 (odd), 33 (does l'Hopital's rule apply?), 35.

b) Interesting ones of the form $0 \cdot \infty$, 0^0, ∞^0, 1^∞, 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) $\lim_{x\to 0^+} x^2 \ln x$ WeBWorK

b) $\lim_{x\to\infty} x \tan(\frac{1}{x})$ WeBWorK

c) $\lim_{x\to\infty} \left(1 - \frac{2}{x}\right)^x$ WeBWorK

d) $\lim_{x\to 0} \dfrac{\sin kx}{\arcsin x}$

e) $\lim_{x\to 0^+} x^{3x}$ WeBWorK

f) $\lim_{x\to\infty} \ln(2x-2) - \ln(x+7)$ 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 $\displaystyle\int_0^\infty 2xe^{-x^2}\,dx$. Use correct limit notation.

5. Page 510 #16. Use correct limit notation.

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