

Calculus

Date:

Items Needed: .Book,

Objective: The students will be able to recognize limits that produce indeterminate forms and be able to apply L'Hopital's rule to evaluate a limit.

Lesson:

- Remember from before when we were doing limits, when you got the form $\frac{0}{0}$ or $\frac{\infty}{\infty}$ it was considered to be indeterminate and you couldn't do anything with it. Now since you know how to take the derivative of about everything you can now find the limit of an indeterminate form.
- Discuss L'Hopital's rule. The limit can be found of an indeterminate by doing $\frac{f'(x)}{g'(x)}$.
- Do example 1 & 2.
- You may have to do the rule more than once. If the function is still indeterminate after you take the derivative, do it again and see if you can make the top or bottom a constant.
- Do example 3.
- Discuss the indeterminate form $0 \cdot \infty$ and how you must rewrite something in the problem to get it to work out.
- Do example 4.
- Discuss the indeterminate form 1^∞ & 0^0 , and how you usually take the ln of both sides.
- Do examples 5 & 6.
- Discuss the indeterminate form $\infty - \infty$, and how you usually find the common denominator of the partial fractions.
- Do example 7.
- Discuss that ∞^0 triggers L'Hopital's but 0^∞ is not an indeterminate form.

Assignment: .Have students do 11, 21, 23, 27, 35, p. 576
Have students do 37, 45, 50, 52, 53, 59 p. 576.
Have students do 79, Extra $y=xe^x$, 88 (Capstone), p. 576

Evaluation: (Could be from any one/several of the following)

Responses from classroom questions
Results of classroom sample problems
Homework responses

Check answer with Calculator
End of the section exam

Enrichment: