Calculus

Date:

Items Needed: .Book, Mathgraphs 49 & 52.

Objective: The students will be able to find the integral of the natural log functions, both regular and trigonometric functions.

Lesson:

- When you take the integral of something and get F(x) you know that when you take the derivative of that function you get the function that was beside the integral sign.
- What was the derivative of the ln x function?
- Lets look at the integral function.
- $\int \frac{1}{x} dx = \ln|x| + C$ or $\int \frac{1}{u} dx = \ln|u| + C$ or $\int \frac{u'}{u} dx = \ln|u| + C$.
- What do you look for when you are trying to integrate?
- Talk about the integration techniques we've used. Don't forget about the substitution method.
- Look at the exploration problems on page 334.
- There is no way we can bring the bottom part of the fraction up to help us to integrate. Why? – zero power of exponent when we use the integral power rule.
- When you get the first power of something on the bottom of a fraction look to see whether the derivative is on the top of the fraction. If it is the integral is nothing more then the ln of it.
- Do $\int \frac{4}{x} dx$ pull the 4 out in front of the integral sign.
- Do $\int \frac{1}{7x+2} dx$ You don't have the 7 so you must multiply by 1/7.
- Do example 3
- Look at example 4 pointing out the comments that I made in the book.
- Looking at example 5, there is no way the derivative of the bottom is on the top so we may have to do something fancy to get it to work.
- If a rational function has a numerator of degree greater than or equal to that of the denominator, division may reveal a form to which you can apply the Log Rule.
- Finish looking at example 5 and do number 37 in the exercises as another example.
- Example number 6 we would probably do it the way we feel most comfortable with which is to bring the denominator to the top and then try to integrate. Show how to do the other solution. It is outlined in my book.
- Look at example 7
- Look at example 8 & 9. These are the actual log rules that are in the front of your books.
- Now you have the six basic trig function, integration formulas.

- Now if you get tan, sec, or cot of a variable you can simply use the memorized formula to find the answer.

Assignment: . Have students do 6, 8, 13, 17, 22, 25, 33, 36, 37, 39, p. 340.
Have students do 49, 52, 58, 69, 77, 80, 90 (Capstone), 101, 102, p.340

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: