Calculus

Date:

Items Needed: .Book, mathgraphs 131 & 132

Objective: The students will be able to develop properties of the natural exponential function and be able to differentiate and integrate natural exponential functions.

Lesson:

- What can you tell me about $f(x) = \ln x$ and the $f(x) = e^x$ function? They are inverses of each other.
- Graph each of them to prove this idea.
- Point out "The number e" on p. 352.
- Remember $\ln(e^x) = x$ and $e^{\ln x} = x$
- Do example 1 and 2.

- Look at the operations with exponential functions

$e^a e^b = e^{a+b}$ and $\frac{e^a}{e^b} = e^{a-b}$

- Review the properties of the Natural Exponential function, p. 353.

- Write down the derivatives of the exponential functions -

$\frac{d}{dx}\left[e^x\right] = e^x$ and $\frac{d}{dx}\left[e^u\right] = e^u \frac{du}{dx}$

- Go over the proof of theorem
- Go over example 3 & 4.
- Look at example 5 & 6.

- Integration Rules for Exponential Functions

$\int e^x dx = e^x + c$ and $\int e^u du = e^u + c$

- Do examples 7-10.

Assignment: .Have students do 3, 7, 13, 15, 37 p. 358
Have students do 39, 42, 49, 52, 53, 56, 57, 60, 71, p. 359
Have students do 79, 83, 92, 94, 100, 105, 109, 110, 114, 116, p. 359
Have students do 131, 132, 135, 136, 139, p. 361

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: