SECTION 5.6: INTEGRALS INVOLVING EXPONENTIALS AND LOGARITHMIC FUNCTIONS

INSTRUCTOR NOTES

This will take at least one day and perhaps longer depending on how much is done by the instructor and how much in groups.

Things to emphasize

- # 1: Get students to remember three principles:

  - When doing u-substitution, you replace all the x's with u's, including replacing the dx.

  - In the previous section, we always picked u to be something raised to a power.

  - Have them build a problem for which u-substitution will obviously work and one in which it will not.
    e.g. $\int (x^4 + 1)(x^5 + 5x)^8 \, dx$ versus $\int (x^5 + 5x)^8 \, dx$ (The second is do-able, but would require us to expand the expression....)

    The goal is for them to see the built-in du.

- #2 Have students complete (a)-(c) independently. Then have them figure out or tell them d and e. Tell them that they will not have to memorize the formulas in b, d and e but should know that they exist and how to use them.

  You will have to help them understand why c has absolute value bars.

- # 3 I would work this on the board very methodically explicitly writing down how u is being selected: exponent of e, the denominator, inside $\ln$ or something for which du is present.

  For 3d, we are reminding them once more about how to manage a definite integral and substitution simultaneously.

- #4 Complete this in groups at the board.