

SECTION 5.6: INTEGRALS INVOLVING EXPONENTIALS AND LOGARITHMIC FUNCTIONS

1. In the previous section, we started integrating using the Method of Substitution. Describe in words (and examples if you like) *how* we figured out what to pick to be u when using this method?

2. Complete the integration formulas below:

(a) $\int e^x dx =$

(d) $\int \ln(x) dx =$

(b) $\int a^x dx =$

(e) $\int \log_a(x) dx =$

(c) $\int \frac{1}{x} dx =$

3. Examples to illustrate four more standard ways to select u .

(a) $\int xe^{x^2} dx =$

(b) $\int \frac{x^2}{x^3 - 7} dx =$

(c) $\int 3x \ln(10 + x^2) dx =$

(d) $\int_1^2 \frac{\ln(x)}{x} dx =$

4. Evaluate the integrals below. Be creative!

$$(a) \int_2^3 \frac{1}{x \ln(x)} dx =$$

$$(b) \int_1^4 \frac{5}{\sqrt{x}e^{\sqrt{x}}} dx =$$

$$(c) \int_0^{\pi/4} \tan(x) dx =$$

$$(d) \int \ln(\cos(x)) \tan(x) dx =$$

$$(e) \int \frac{e^{4x} - e^{-4x}}{e^{4x} + e^{-4x}} dx =$$