MA 182 Integrals Involving Exponential Functions Section 5.5

1. Often an integral involving an exponential function can be transformed into a much simpler integral of the type  $\int e^u du$  by using an appropriate u-substitution for the exponent.

(a) 
$$\int e^{5x} dx$$
 Let  $u = 5x$ 

(b) 
$$\int e^{kx} dx$$
 Let  $u =$ 

(c) 
$$\int \frac{1}{e^x} dx$$
 Hint: Rewrite the integral as  $\int e^{-x} dx$  and make use of your answer to part (b).

(d) 
$$\int x^2 e^{x^3} dx$$
 Let  $u = x^3$ 

►

(e) 
$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$$
 Let  $u =$ 

2. Not every integral involving an exponential function is best integrated by substituting u for the exponent. Often, if the integrand involves more than one exponential function, it is best to substitute u for more than just the exponent.

(a) 
$$\int \frac{e^x}{e^x + 1} dx$$
 Let  $u = e^x + 1$ 

(b) 
$$\int e^{2x} \sqrt{e^{2x}+5} \, dx$$
 Let  $u =$