

Section 5.6

After viewing the lecture videos and reading the textbook, you should be able to answer the following questions:

1. To evaluate the definite integral $\int_{-1}^1 3x^2\sqrt{x^3+1} dx$, we make the substitution $u = x^3 + 1$ and get

$$\int_{-1}^1 3x^2\sqrt{x^3+1} dx = \int_0^2 \sqrt{u} du.$$

Finish evaluating the definite integral.

2. Use the method of transforming the limits of integration (see the textbook Example 1 Method 1) to evaluate

$$\int_{-1}^1 4x(2x^2 + 4)^5 dx.$$

3. Use the method of transforming the indefinite integral, integrating, changing back to x , and using the original limits of integration (see the textbook Example 1 Method 2) to evaluate

$$\int_{-1}^1 4x(2x^2 + 4)^5 dx.$$

4. If f is an **even** function, then what with the relationship between $f(x)$ and $f(-x)$? If f is an **odd** function, then what with the relationship between $f(x)$ and $f(-x)$?
5. Is cosine an even or odd function? How about sine, tangent, secant, cosecant, and cotangent?
6. Evaluate $\int_{-\pi/2}^{\pi/2} \cos x dx$ and $\int_{-\pi/2}^{\pi/2} \sin x dx$.
7. If f and g are continuous with $f(x) \geq g(x)$ on $[a, b]$, then what is the area of the region between the curves $y = f(x)$ and $y = g(x)$ from a to b ?