

## 6.5-Substitution

**Recall:** Chain Rule for Derivatives:  $\frac{d}{dx}(f(g(x))) =$

Therefore

**Problem:** Recognizing when you have an integral of this form and what  $f$  and  $g$  are.

**Solution:** Substitute for  $g(x)$ , your "inner function"

*Examples:*

Find the area under the graph of  $f(x) = \sin(Bx)$ , from  $x = 0$  to  $x = \frac{\pi}{B}$ .

Compute  $\int_0^1 x(2x^2 - 1)^{10} dx$

Compute  $\int \frac{e^{2x}}{e^{2x} + 2} dx$

Compute  $\int x^2 \sqrt{x-1} dx$

**Symmetric Functions:**

If  $f$  is a continuous, even function on  $[-a, a]$ , then  $\int_{-a}^a f(x) dx =$

If  $f$  is a continuous, odd function on  $[-a, a]$ , then  $\int_{-a}^a f(x) dx =$

**On Your Own:** 6.5 #2,6,11,12,17,21,27,31,35,36,38,41,47,53,59,60,68,71,76