

In-class exercise 1/10/06

$$(\S 5.5 \# 1) \quad \int \cos(3x) dx = \int \cos(u) \frac{du}{3}$$

$$\begin{aligned} u &= 3x \\ du &= 3dx \\ \therefore dx &= \frac{1}{3} du \end{aligned}$$

$$= \frac{1}{3} \int \cos(u) du$$

$$= \frac{1}{3} \sin(u) + C$$

$$= \boxed{\frac{1}{3} \sin(3x) + C}$$

$$(\S 5.5 \# 20) \quad \int \tan(2\theta) \sec(2\theta) d\theta = \int \tan(u) \sec(u) \frac{du}{2}$$

$$\begin{aligned} u &= 2\theta \\ du &= 2d\theta \\ d\theta &= \frac{1}{2} du \end{aligned}$$

$$= \frac{1}{2} \int \sec(u) \tan(u) du$$

$$= \frac{1}{2} \sec(u) + C$$

$$= \boxed{\frac{1}{2} \sec(2\theta) + C}$$