

Math 181 Monday, February 22

Section 7.2 (part 2)

$$\int \cos^n(x) \sin^m(x) dx$$

Tue - 7.3

Thu - 7.3

Fri - 7.4

BYOB Movies

$$\int \tan^n(x) \sec^m(x) dx$$

① Even power $\sec(x)$

② Odd power $\tan(x)$

③ Odd power $\sec(x)$ & even power of $\tan(x)$

Convert $\tan(x)$ to $\sec(x)$ (via
& deal with powers of $\sec(x)$ via

$$\tan^2(x) + 1 = \sec^2(x)$$

$$\tan^2(x) = \sec^2(x) - 1$$

$$\sin^2(x) + \cos^2(x) = 1$$

$$\frac{1}{\cos^2(x)}$$

$$\left[\tan^2(x) + 1 = \sec^2(x) \right]$$

$$\int \sec^n(x) dx = \frac{1}{n-1} \sec^{n-2}(x) \tan(x) + \frac{n-2}{n-1} \int \sec^{n-2}(x) dx$$

Reduction formula $\int \sec(x) dx = \ln|\sec(x) + \tan(x)| + C$


$$\underline{\text{Ex}} \quad \int \tan^{14}(x) \sec^5(x) dx$$

$$= \int (\tan^2(x))^7 \sec^5(x) dx$$

$$= \int (\sec^2(x) - 1)^7 \sec^5(x) dx$$

$$= \int (\sec^2(x))^7 - 7(\sec^2(x))^6 + \dots - 1) \sec^5(x) dx$$

$$= \int \sec^{19}(x) - 7 \sec^{17}(x) + \dots - \sec^5(x) dx$$


 reduction formula
 $\int \sec^{17}(x) dx$

$\sin(mx), \cos(nx)$

Identities

$m \neq n$

$$\int \sin(mx) \sin(nx) dx$$

$$\sin(mx) \sin(nx) = \frac{1}{2} [\cos((m-n)x) - \cos((m+n)x)]$$