Section 7.2 ***Trigonometric Integrals***

For $\int \sin^m x \cos^n x dx \Rightarrow \begin{cases} if\ m\ is\ odd => let\ u = \cos(x) \\ if\ n\ is\ odd => let\ u = \sin(x) \end{cases}$

Ex: Integrate the following:

a) $\int \sin^4(3x)\cos^5(3x)dx$

b) $\int \sqrt[5]{\cos^3(2x)}\sin^3(2x)dx$

b) $\int \frac{\cos^5(3x)}{\sqrt[4]{\sin^3(3x)}}dx$

What if none of the power is odd ➔ Double angle formulas

c) $\int \cos^4(3x)\,dx$

For tangent / cotangent / secant / cosecant functions

Ex: Evaluate

$$\int \tan x dx = \ln|\sec x| + C$$

$$\int \sec x dx = \ln|\sec x + \tan x| + C$$

$$\int \csc x dx = \ln|\csc x - \cot x| + C$$

Ex: Integrate the following:

a) $\int \sec^3(4x)\tan^3(4x)\,dx$

b) $\int \sec^4(3x)\tan^4(3x)\,dx$

c) $\int \sec^4(2x)\tan^3(2x)\,dx$

d) $\int \tan^3(4x)\,dx$

d) $\int \csc^4(5x)\,dx$

b) $\int \sec^3 x\,dx$

Evaluating $\int \sin mx \cos nxdx; \int \sin mx \sin nxdx; \int \cos mx \cos nxdx$

a) $\sin A \cos B = \frac{1}{2}[\sin(A-B)+\sin(A+B)]$

b) $\sin A \sin B = \frac{1}{2}[\cos(A-B)-\cos(A+B)]$

c) $\cos A \cos B = \frac{1}{2}[\cos(A-B)+\cos(A+B)]$

Ex: Evaluate:

a) $\int \sin 7x \cos 5xdx$

b) $\int \cos 4x \cos 3xdx$