

Math 187 – Quiz #3 Formula Sheet

Trig Integration

$$\begin{aligned}\int \tan x \, dx &= -\ln|\cos x| + C \\ &= \ln|\sec x| + C\end{aligned}$$

$$\begin{aligned}\int \cot x \, dx &= \ln|\sin x| + C \quad (\text{textbook}) \\ &= -\ln|\csc x| + C \quad (\text{Gilles' materials})\end{aligned}$$

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

$$\begin{aligned}\int \csc x \, dx &= \ln|\csc x - \cot x| + C \quad (\text{textbook}) \\ &= -\ln|\csc x + \cot x| + C \quad (\text{Gilles' materials})\end{aligned}$$

$$\int \sec^2 x \, dx = \tan x + C$$

$$\int \csc^2 x \, dx = -\cot x + C$$

$$\int \sec x \tan x \, dx = \sec x + C$$

$$\int \csc x \cot x \, dx = -\csc x + C$$

$$\int \frac{dx}{\sqrt{a^2 - x^2}} = \sin^{-1}\left(\frac{x}{a}\right) + C$$

$$\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) + C$$

Integration by parts

$$\int u \, dv = uv - \int v \, du$$

Trigonometry formulae

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\cos^2 \theta = \frac{1 + \cos 2\theta}{2}$$

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$\sin^2 \theta = \frac{1 - \cos 2\theta}{2}$$

$$\cot^2 \theta + 1 = \csc^2 \theta$$

Trig Substitution

$$a^2 - x^2 \rightarrow x = a \sin \theta$$

$$x^2 + a^2 \rightarrow x = a \tan \theta$$

$$x^2 - a^2 \rightarrow x = a \sec \theta$$