Calculus Section 4.1 Trig Antiderivatives

-Use indefinite integral notation for antiderivatives.

-Use basic integration rules to find antiderivatives.

Homework: page 251 #'s 24 - 32

Trig antiderivatives are the inverse of trig derivatives.

Trig derivatives and antiderivatives:

$\frac{dy}{dx}\sin x = \cos x$

$\frac{dy}{dx}\cos x = -\sin x$

$\frac{dy}{dx}\tan x = \sec^2 x$

$\frac{dy}{dx}\cot x = -\csc^2 x$

$\frac{dy}{dx}\sec x = \sec x \tan x$

$\frac{dy}{dx}\csc x = -\csc x \cot x$

$\int \cos x dx =$ sinx + C

$\int \sin x dx =$ -cosx + C

$\int \sec^2 x dx =$ tanx + C

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

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

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

Examples)

$\int \frac{\sin x}{\cos^2 x} dx$

$\int \tan x \sec x \, dx$

$\sec x + C$

$\int \cot x \sin x dx$

$\int \frac{\cos x}{\sin x} \sin x \, dx$

$\int \cos x \, dx$

$\sin x + C$

$\int (\sec^2 x + \sin x - \csc^2 x) dx$

$\tan x - \cos x + \cot x + C$

$\int -(\sec x \tan x - \cos x) dx$

$\int (-\sec x \tan x + \cos x) dx$

$-\sec x + \sin x + C$