TOPIC: INTEGRALS OF TRIG FUNCTIONS

Integrals Resulting in Basic Trig Functions

◆ Just like with power functions, finding the integral of trig functions is just the _____ of finding the derivative.

Recall: Derivatives of Sine & Cosine	New: Integrals of Sine & Cosine
$\frac{d}{dx}\sin x = \cos x$	$\int \cos x\,dx = \_\_\_\_\_ + C$
$\frac{d}{dx}\cos x = -\sin x$	$\int \sin x\,dx = \_\_\_\_\_ + C$

EXAMPLE Find the indefinite integral.

(*A*) $\int (3\sin x + 2\cos x)\,dx$

New

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

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

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

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

(*B*) $\int (7\sec x \tan x - \csc^2 x)\,dx$

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PRACTICE Find $g(\theta)$ by evaluating the following indefinite integral.

$$g(\theta) = \int (5\sec^2\theta - 2\csc^2\theta)d\theta$$

PRACTICE Find $g(x)$ by evaluating the following indefinite integral.

$$g(x) = \int (\sin^2 x - 100\csc x \cot x + \cos^2 x)dx$$

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EXAMPLE Verify the following indefinite integral by differentiation.

$$\int \frac{cos\sqrt{x}}{\sqrt{x}}\,dx = 2sin\sqrt{x} + C$$