

Integration of Trigonometric Functions

Learning Objectives

- Evaluate indefinite integrals involving trigonometric functions
 - Evaluate definite integrals involving trigonometric functions
 - Compute integrals of trigonometric functions in application problems
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Evaluate indefinite integrals involving trigonometric functions

1. Evaluate the following indefinite integrals.

a. $4 \int \sec x \sin x \, dx$

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

Evaluate definite integrals involving trigonometric functions

2. Evaluate $\int_{-\frac{\pi}{4}}^{\frac{\pi}{2}} \sin x \, dx$.

Compute integrals of trigonometric functions in application problems

3. The number of daylight hours in Baltimore, MD can be approximated by the function

$$H(t) = 12 - 2.7 \cos \left[\frac{2\pi}{365} (t + 11) \right],$$
 where t is days since the beginning of the year (Jan 1:

$t = 1$). Find the total number of daylight hours in the month of July. Round your answer to the nearest whole hour.

Days of the Year

Jan 1 = 1	Feb 1 = 32	Mar 1 = 60	Apr 1 = 91
May 1 = 121	June 1 = 152	July 1 = 182	August 1 = 213
September 1 = 244	October 1 = 274	November 1 = 305	December 1 = 335

ANSWER KEY

1. a. $-4 \ln|\cos x| + C$; b. $-2 \csc x + C$

2. $\frac{\sqrt{2}}{2}$

3. 447 hours