

Pythagorean trigonometric identities

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

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

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

Integral	Relevant expression	Corresponding Trig. Identity	Substitution	New integral
$\int \sqrt{1-x^2} dx$	$1-x^2$	$1-\sin^2 \theta$	$x = \sin \theta$	$\int \sqrt{1-\sin^2 \theta} \cos \theta d\theta = \int \cos^2 \theta d\theta$
$\int \frac{1}{1+x^2} dx$				
$\int \frac{2}{\sqrt{x^2-1}} dx$				
$\int \frac{x}{\sqrt{4-x^2}} dx$				
$\int \frac{1}{x^2\sqrt{x^2-16}} dx$				
$\int \frac{6x}{\sqrt{16+9x^4}} dx$				
$\int \sqrt{x^2+2x-3} dx$				

Going back to x :

Example. Find the integral $\int \frac{\sqrt{16x^2 - 9}}{x} dx$.

