

## Summary of Trig Substitution

Here is a table of different trig substitutions and how they can be useful.

If your integrand contains	Make substitution	To get
$\sqrt{a^2 - x^2}$	$x = a \cos \theta$ or $x = a \sin \theta$	$a \sin \theta$ or $a \cos \theta$
$\sqrt{a^2 + x^2}$	$x = a \tan \theta$	$a \sec \theta$
$\sqrt{x^2 - a^2}$	$x = a \sec \theta$	$a \tan \theta$

These are the three basic forms which are integrated using trig substitution. In general, you use trig substitution to replace the square root of a quadratic function by a trigonometric function. Once you've done this, integrate, then use what we've learned about right triangles and undoing trig substitution to get a final answer.

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