

Chapter 07

INDEFINITE INTEGRAL

Standard Substitution:

In some standard integrand or a part of it, we have standard substitution. List of standard is as follows:

Expression	Substitution
$x^2 + a^2$ or $\sqrt{x^2 + a^2}$	$x = a \tan \theta$ or $a \cot \theta$
$x^2 - a^2$ or $\sqrt{x^2 - a^2}$	$x = a \sec \theta$ or $a \operatorname{cosec} \theta$
$a^2 - x^2$ or $\sqrt{a^2 - x^2}$	$x = a \sin \theta$ or $a \cos \theta$
$\sqrt{a+x}$ or $\sqrt{a-x}$	$x = a \cos 2\theta$
$(x \pm \sqrt{x^2 \pm a^2})^n$	Expression inside the bracket = t
$\sqrt{(x-a)(b-x)}$	$x = a \cos^2 \theta + b \sin^2 \theta$

$$\frac{1}{(x+a)^{1-\frac{1}{n}}(x+b)^{1+\frac{1}{n}}}(n \in \mathbb{N}, n > 1) \quad \frac{x+a}{x+b} = t$$