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Following substitutions are used to write inverse trigonometric functions in simplest form:

S.No.	Expression	Substitute
1.	$\sqrt{a^2-x^2}$	$x=a\sin\theta$ or $x=a\cos\theta$
2.	$\sqrt{a^2+x^2}$	$x=a\tan\theta$ or $x=a\cot\theta$
3.	$\sqrt{x^2-a^2}$	$x=a\sec\theta$ or $x=a\,\mathrm{cosec}\,\theta$
4.	$\sqrt{a+x}$ or $\sqrt{a-x}$	$x=a\cos\theta$ or $x=a\cos2\theta$
5.	$\sqrt{1+x^2}\pm\sqrt{1-x^2}, \sqrt{\frac{1+x^2}{1-x^2}}, \sqrt{\frac{1-x^2}{1+x^2}}$	$x^2=\cos^2\theta$
6.	$\sqrt{a^2+x^2}\pm\sqrt{a^2-x^2}, \sqrt{\frac{a^2+x^2}{a^2-x^2}}, \sqrt{\frac{a^2-x^2}{a^2+x^2}}$	$x^2=a^2\cos2\theta$
7.	$\sqrt{1+x}\pm\sqrt{1-x}, \sqrt{\frac{1-x}{1+x}}, \sqrt{\frac{1+x}{1-x}}$	$x=\cos2\theta$
8.	$\sqrt{a+x}\pm\sqrt{a-x}, \sqrt{\frac{a+x}{a-x}}, \sqrt{\frac{a-x}{a+x}}$	$x=a\cos2\theta$

Remember Points

(i) Sometimes, it may happen, that some of the values of x that we find out does not satisfy the given equation.

(ii) While solving an equation, do not cancel the common factors from both sides.