Inverse Trigonometry Formulas

Inverse trigonometry functions are used to find the angles when the values of the trigonometric functions (sine, cosine, tangent, etc.) are known. Below are the standard formulas for inverse trigonometric functions:

1. Inverse Sine Function $\sin^{-1}(x)$:

- Domain: $-1 \leq x \leq 1$
- Range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
- Formula: $\sin(\sin^{-1}(x)) = x$ for $x \in [-1, 1]$

2. Inverse Cosine Function $\cos^{-1}(x)$:

- Domain: $-1 \leq x \leq 1$
- Range: $0 \leq y \leq \pi$
- Formula: $\cos(\cos^{-1}(x)) = x$ for $x \in [-1, 1]$

3. Inverse Tangent Function $\tan^{-1}(x)$:

- Domain: $-\infty < x < \infty$
- Range: $-\frac{\pi}{2} < y < \frac{\pi}{2}$
- Formula: $\tan(\tan^{-1}(x)) = x$ for all x

4. Inverse Cotangent Function $\cot^{-1}(x)$:

- Domain: $-\infty < x < \infty$
- Range: $0 < y < \pi$
- Formula: $\cot(\cot^{-1}(x)) = x$ for all x

5. Inverse Secant Function $\sec^{-1}(x)$:

- Domain: $|x| \geq 1$
- Range: $0 \leq y \leq \pi, y \neq \frac{\pi}{2}$
- Formula: $\sec(\sec^{-1}(x)) = x$ for $|x| \geq 1$

6. Inverse Cosecant Function $\csc^{-1}(x)$:

- Domain: $|x| \geq 1$
- Range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}, y \neq 0$
- Formula: $\csc(\csc^{-1}(x)) = x$ for $|x| \geq 1$

These are the basic inverse trigonometric function formulas, used extensively in solving trigonometric equations and analyzing periodic functions.