

Section 6.5: The Inverse Trig. Functions

- 1- **The inverse Sine function:** denoted by \sin^{-1} or \arcsin is defined by
 $y = \sin^{-1} x$ if and only if $x = \sin y$
for $-1 \leq x \leq 1$ and $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

Properties:

- a-** $\sin(\sin^{-1} x) = x$ if $-1 \leq x \leq 1$
b- $\sin^{-1}(\sin y) = y$ if $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

- 2- **The inverse Cosine function:** denoted by \cos^{-1} or \arccos is defined by
 $y = \cos^{-1} x$ if and only if $x = \cos y$
for $-1 \leq x \leq 1$ and $0 \leq y \leq \pi$

Properties:

- a-** $\cos(\cos^{-1} x) = x$ if $-1 \leq x \leq 1$
b- $\cos^{-1}(\cos y) = y$ if $0 \leq y \leq \pi$

- 3- **The inverse tangent function:** denoted by \tan^{-1} or \arctan is defined by
 $y = \tan^{-1} x$ if and only if $x = \tan y$
for $-\infty < x < \infty$ and $-\frac{\pi}{2} < y < \frac{\pi}{2}$

Properties:

- a-** $\tan(\tan^{-1} x) = x$ if $-\infty < x < \infty$
b- $\tan^{-1}(\tan y) = y$ if $-\frac{\pi}{2} < y < \frac{\pi}{2}$

- 4- **The inverse cotangent function:** denoted by \cot^{-1} or $\operatorname{arc} \cot$ is defined by
 $y = \cot^{-1} x$ if and only if $x = \cot y$
for $-\infty < x < \infty$ and $0 < y < \pi$

Properties:

- a-** $\cot(\cot^{-1} x) = x$ if $-\infty < x < \infty$
b- $\cot^{-1}(\cot y) = y$ if $0 < y < \pi$