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कक्षा – 12

गणित

प्रतिलोम त्रिकोणमितीय फलन

अध्याय – 2

भाग - 1

आधारभूत संकल्पनाएँ

By : Rajendra Yadav Sir

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आधारभूत संकल्पनाएँ :-

त्रिकोणमितीय फलन	Domain (प्रांत)	Range (परिसर)
sin x	R	[–1, 1]
cos x	R	[–1, 1]
tan x	R – (2n + 1) π/2	R
cot x	R – n π	R
sec x	R – (2n + 1) π/2	R – (–1, 1)
cosec x	R – n π	R – (–1, 1)

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$y = \operatorname{cosec} x$

$x \in R - n\pi$

$n \in Z$

$y \in (-\infty, -1] \cup [1, +\infty)$

OR

$y \in R - (-1, 1)$

$\operatorname{cosec} x = \frac{1}{\sin x}$

$\sin x \neq 0$

$0, 180^\circ, 360^\circ, \ldots\ldots$

$0, \pi, 2\pi, 3\pi, 4\pi, \ldots\ldots$

$n\pi \; ; n \in z$

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$y = \sec x$

$\sec x = \frac{1}{\cos x}$

$x \in R - (2n+1)\frac{\pi}{2}$

$n \in Z$

$\cos x \neq 0$

$\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \ldots\ldots$

$y \in (-\infty, -1] \cup [1, +\infty)$

$(2n+1)\frac{\pi}{2}$; $n \in Z$

OR

$y \in R - (-1, 1)$

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$y = \cot x$

$\cot x = \frac{\cos x}{\sin x}$

$x \in R - n\pi$

$\sin x \neq 0$

$n \in Z$

$0, 180, 360, \ldots$

$y \in R \Rightarrow (-\infty, +\infty)$

$0, \pi, 2\pi, 3\pi, 4\pi, \ldots$

$\boxed{n\pi}$; $n \in Z$

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$y = \tan x$

$\tan x = \frac{\sin x}{\cos x}$

$x \in R - (2n+1)\frac{\pi}{2}$

$n \in Z$

$\cos x \neq 0$

$x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \ldots$

$y \in R \Rightarrow (-\infty, +\infty)$

$(2n+1)\frac{\pi}{2} : n \in Z$

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$y = \cos x$

$x \longrightarrow$ Domain (प्रांत)

$y \longrightarrow$ Range (परिसर)

$x \in R$ प्रांत

$y \in [-1, 1]$ परिसर



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$y = \sin x$ (कोण)

$x \longrightarrow$ Domain (प्रांत)

$y \longrightarrow$ Range (परिसर)

$x \in R$ प्रांत

$y \in [-1, 1]$ परिसर



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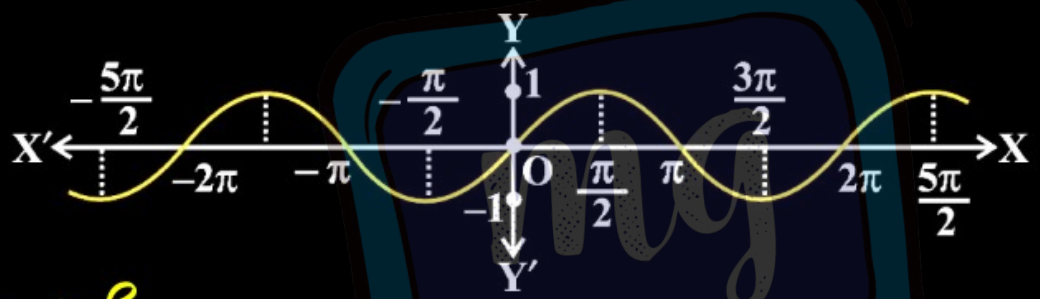
I.T.F.	Domain	Range
$y = \sin^{-1} x$	$[-1, 1]$	$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
$y = \cos^{-1} x$	$[-1, 1]$	$[0, \pi]$
$y = \tan^{-1} x$	R	$\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$
$y = \cot^{-1} x$	R	$(0, \pi)$
$y = \sec^{-1} x$	$R - (-1, 1)$	$[0, \pi] - \left\{\frac{\pi}{2}\right\}$
$y = \text{cosec}^{-1} x$	$R - (-1, 1)$	$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] - \{0\}$

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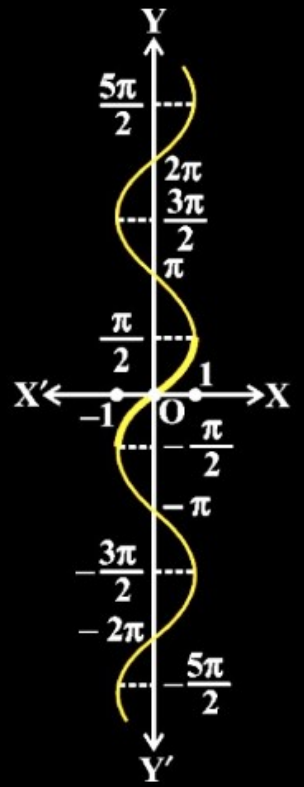
$y = \sin x$



$x \in R$

$y \in [-1, 1]$

$y = \sin^{-1} x$

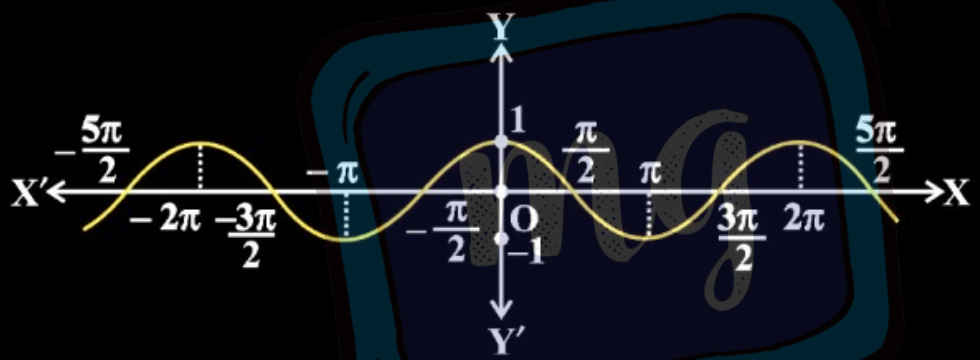


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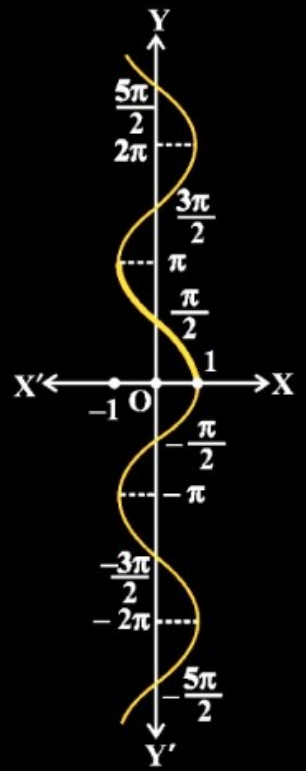
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$y = \cos x$



$y = \cos^{-1} x$

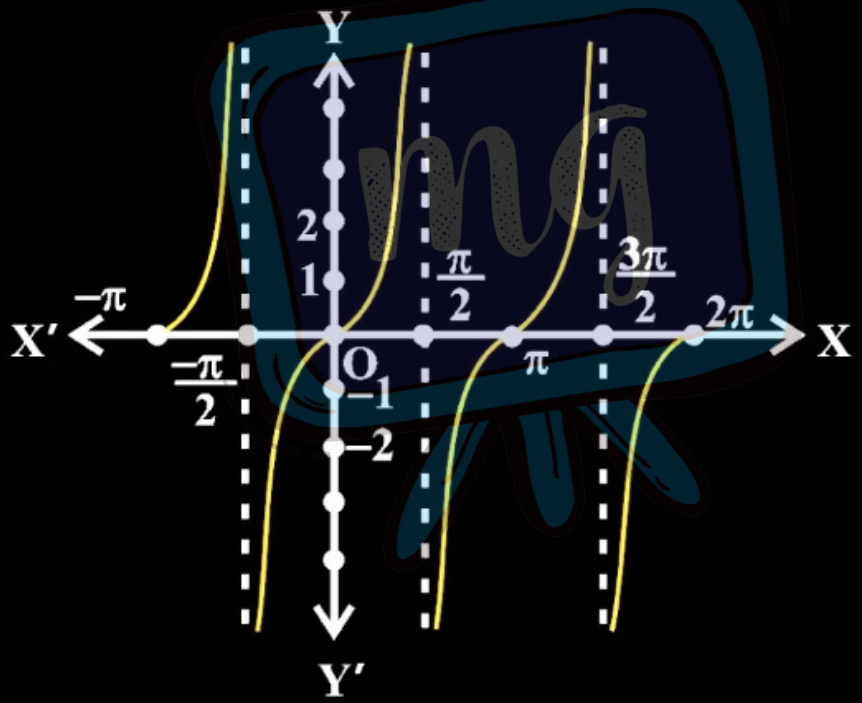


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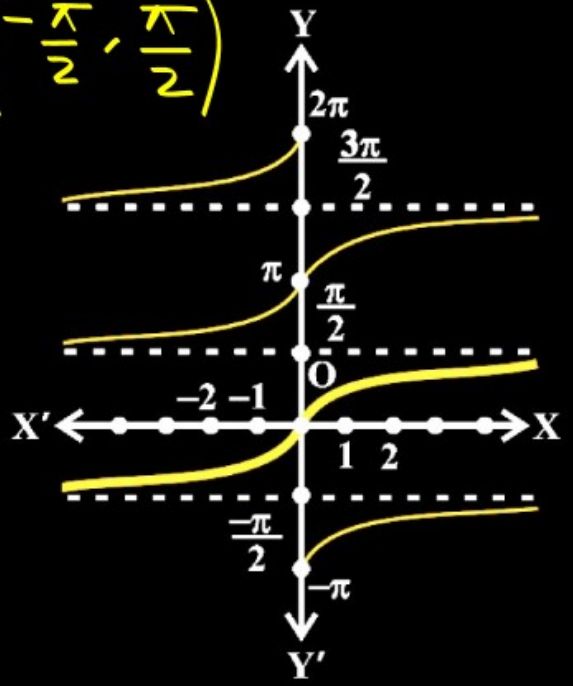
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$y = \tan x$



$y = \tan^{-1} x$

$\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

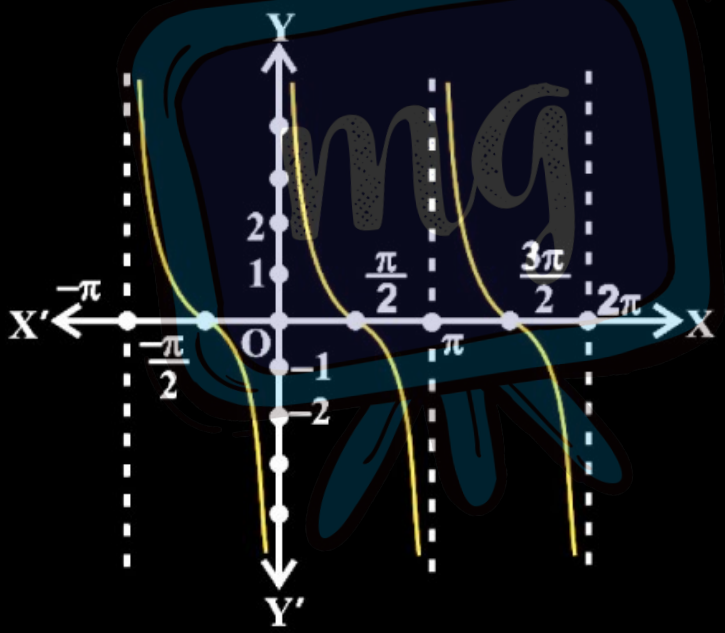


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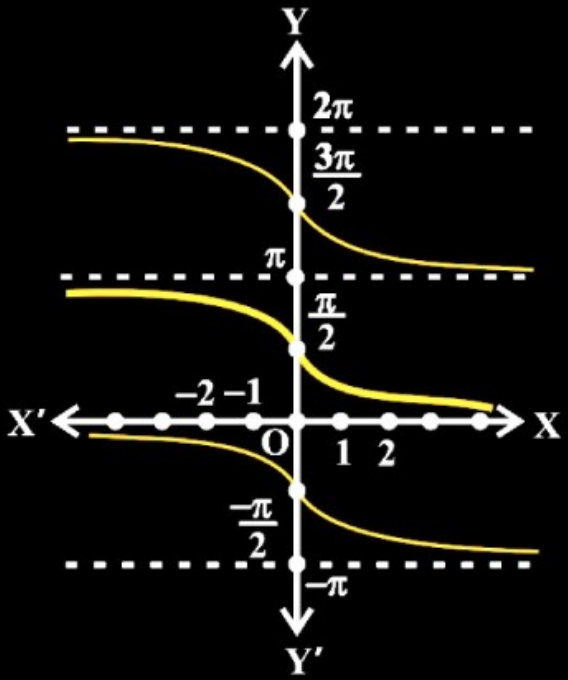
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$y = \cot x$



$y = \cot^{-1} x$



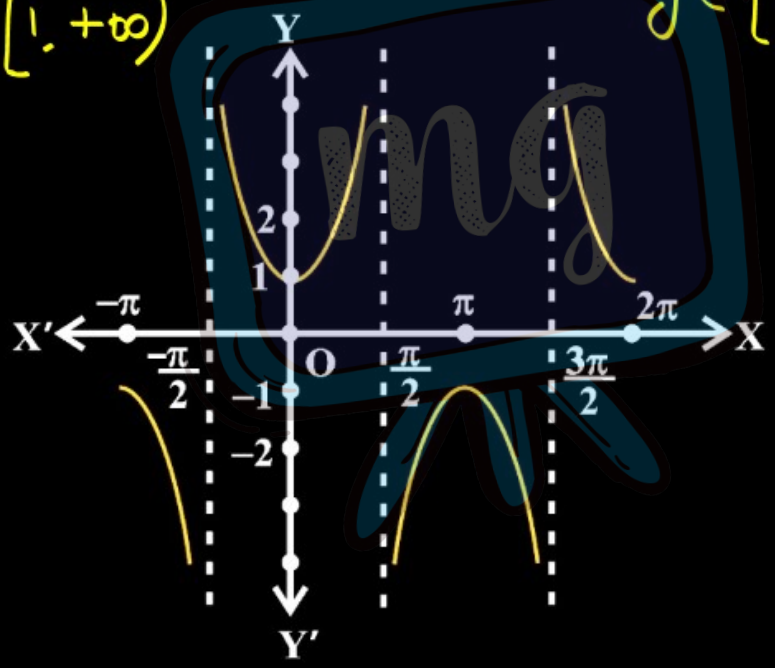
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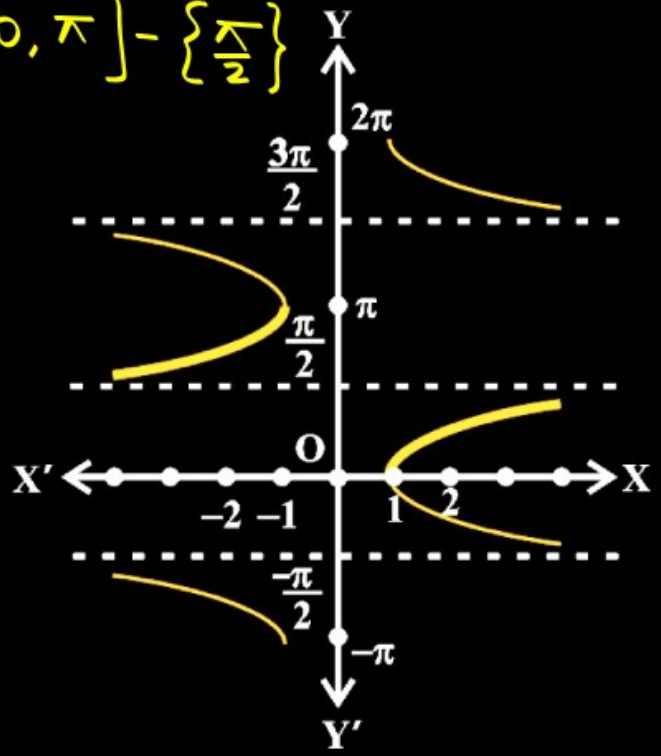
$y = \sec x$

$y \in (-\infty, -1] \cup [1, +\infty)$



परिसर $y = \sec^{-1} x$

$y \in [0, \pi] - \{\frac{\pi}{2}\}$



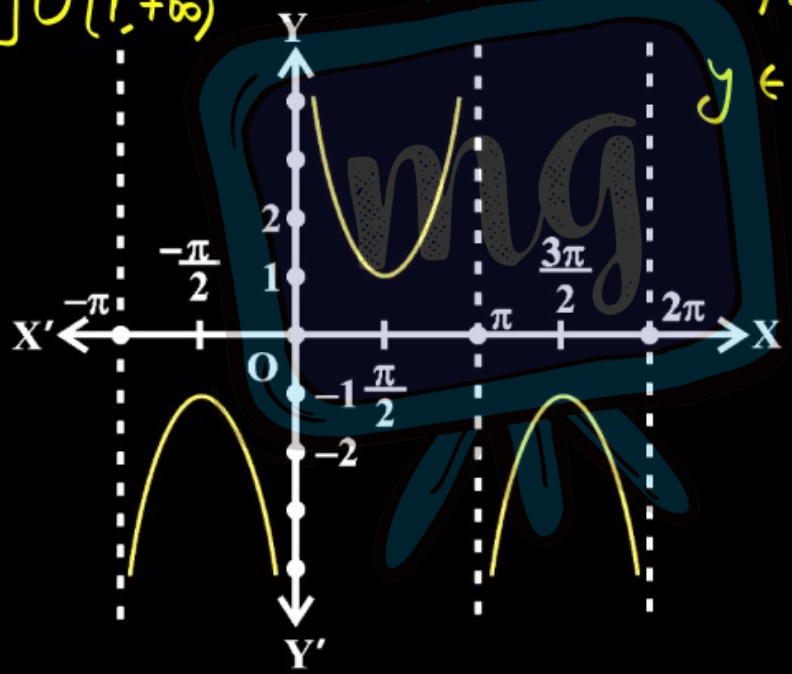
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y = cosec x

$y \in (-\infty, -1] \cup [1, +\infty)$



y = cosec^{-1} x

परिसर

$y \in [\frac{-\pi}{2}, \frac{\pi}{2}] - \{0\}$

