

EXERCISE 6.3

Sketch the graphs of the following functions:

1. $f(x) = 2 \operatorname{cosec} \pi x$

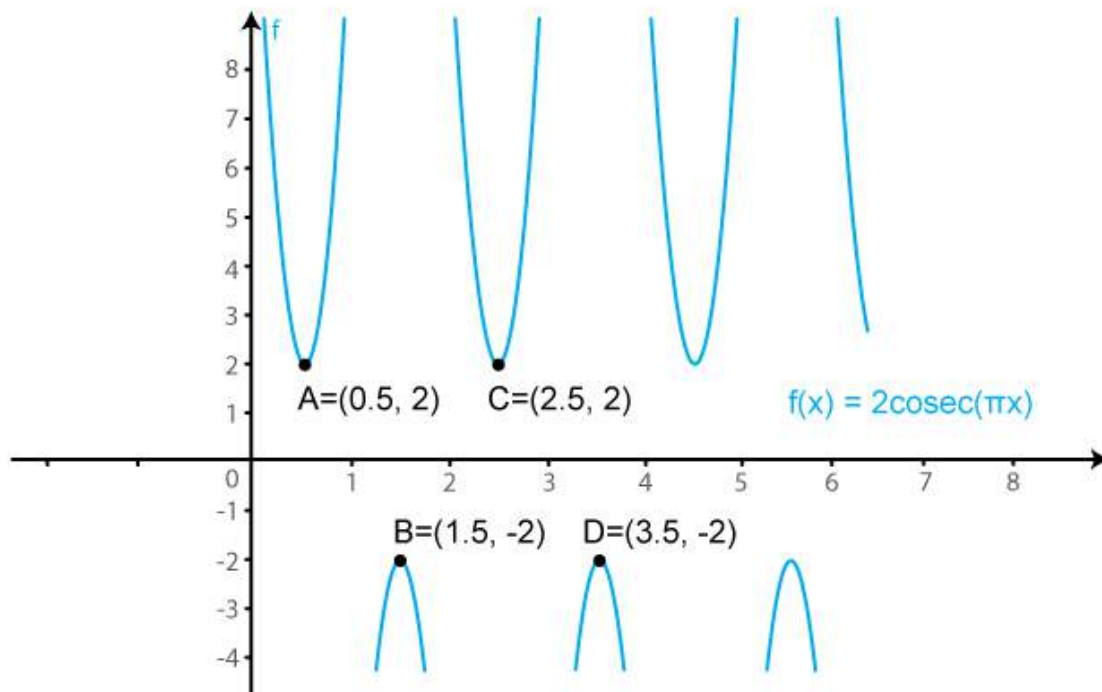
Solution:

We know that $f(x) = \operatorname{cosec} x$ is a periodic function with period 2π .

So, $f(x) = 2 \operatorname{cosec} (\pi x)$ is a periodic function with period 2. So, we will draw the graph of $f(x) = 2 \operatorname{cosec} (\pi x)$ in the interval $[0, 2]$. The values of $f(x) = 2 \operatorname{cosec} (\pi x)$ at various points in $[0, 2]$ are listed in the following table:

x	0 (A)	1/2 (B)	1 (C)	-1 (D)	3/2 (E)	-2 (F)	2 (G)	5/2 (H)
$f(x) = 2 \operatorname{cosec} (\pi x)$	∞	2	∞	$-\infty$	-2	$-\infty$	∞	2

The required curve is:



2. $f(x) = 3 \sec x$

Solution:

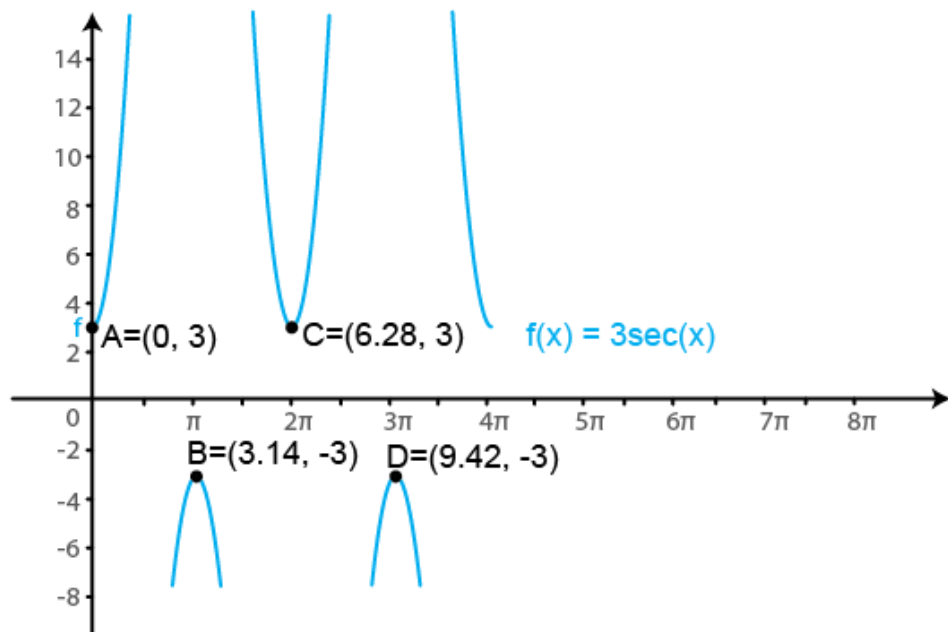
We know that $f(x) = \sec x$ is a periodic function with period π .

So, $f(x) = 3 \sec (x)$ is a periodic function with period π . So, we will draw the graph of f

$f(x) = 3 \sec(x)$ in the interval $[0, \pi]$. The values of $f(x) = 3 \sec(x)$ at various points in $[0, \pi]$ are listed in the following table:

x	0 (A)	$\pi/2$ (B)	$-\pi/2$ (C)	π (D)	$-3\pi/2$ (E)	$3\pi/2$ (F)	2π (G)	$5\pi/2$ (H)
$f(x) = \sec x$	3	∞	$-\infty$	-3	$-\infty$	∞	3	∞

The required curve is:



3. $f(x) = \cot 2x$

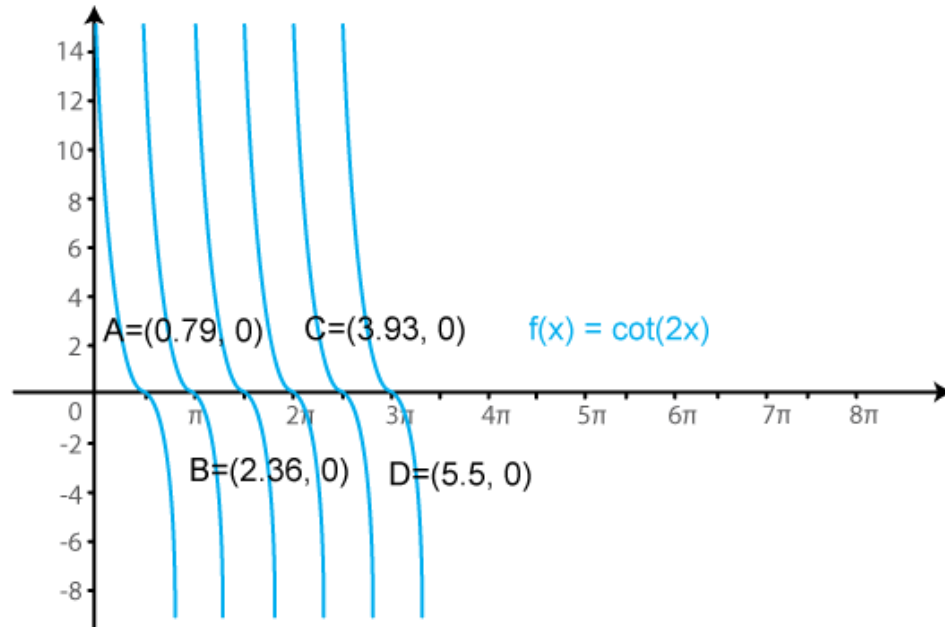
Solution:

We know that $f(x) = \cot x$ is a periodic function with period π .

So, $f(x) = \cot(2x)$ is a periodic function with period π . So, we will draw the graph of $f(x) = \cot(2x)$ in the interval $[0, \pi]$. The values of $f(x) = \cot(2x)$ at various points in $[0, \pi]$ are listed in the following table:

x	0 (A)	$\pi/4$ (B)	$-\pi/2$ (C)	$\pi/2$ (D)	$3\pi/4$ (E)	$-\pi$ (F)
$f(x) = \cot x$	$\rightarrow \infty$	0	$-\infty$	$\rightarrow \infty$	0	$-\infty$

The required curve is:



4. $f(x) = 2 \sec \pi x$

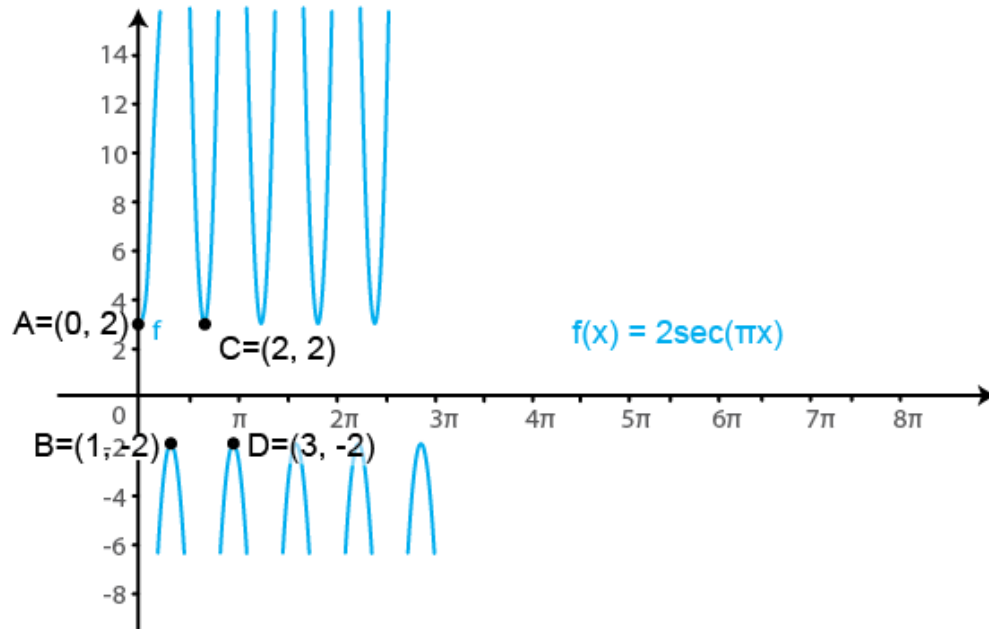
Solution:

We know that $f(x) = \sec x$ is a periodic function with period π .

So, $f(x) = 2 \sec(\pi x)$ is a periodic function with period 1. So, we will draw the graph of $f(x) = 2 \sec(\pi x)$ in the interval $[0, 1]$. The values of $f(x) = 2 \sec(\pi x)$ at various points in $[0, 1]$ are listed in the following table:

x	0	$1/2$	$-1/2$	1	$-3/2$	$3/2$	2
$f(x) = 2 \sec(\pi x)$	2	∞	$\rightarrow -\infty$	-2	$-\infty$	∞	2

The required curve is:



5. $f(x) = \tan^2 x$

Solution:

We know that $f(x) = \tan x$ is a periodic function with period π .

So, $f(x) = \tan^2(x)$ is a periodic function with period π . So, we will draw the graph of $f(x) = \tan^2(x)$ in the interval $[0, \pi]$. The values of $f(x) = \tan^2(x)$ at various points in $[0, \pi]$ are listed in the following table:

x	0 (A)	$\pi/2$ (B)	$\pi/2$ (C)	π (D)	$3\pi/2$ (E)	$3\pi/2$ (F)	2π
$f(x) = \tan^2(x)$	0	∞	$\rightarrow \infty$	0	∞	$\rightarrow \infty$	0

The required curve is:

