EXERCISE 6.3

Sketch the graphs of the following functions:

1. f (x) = 2 cosec πx

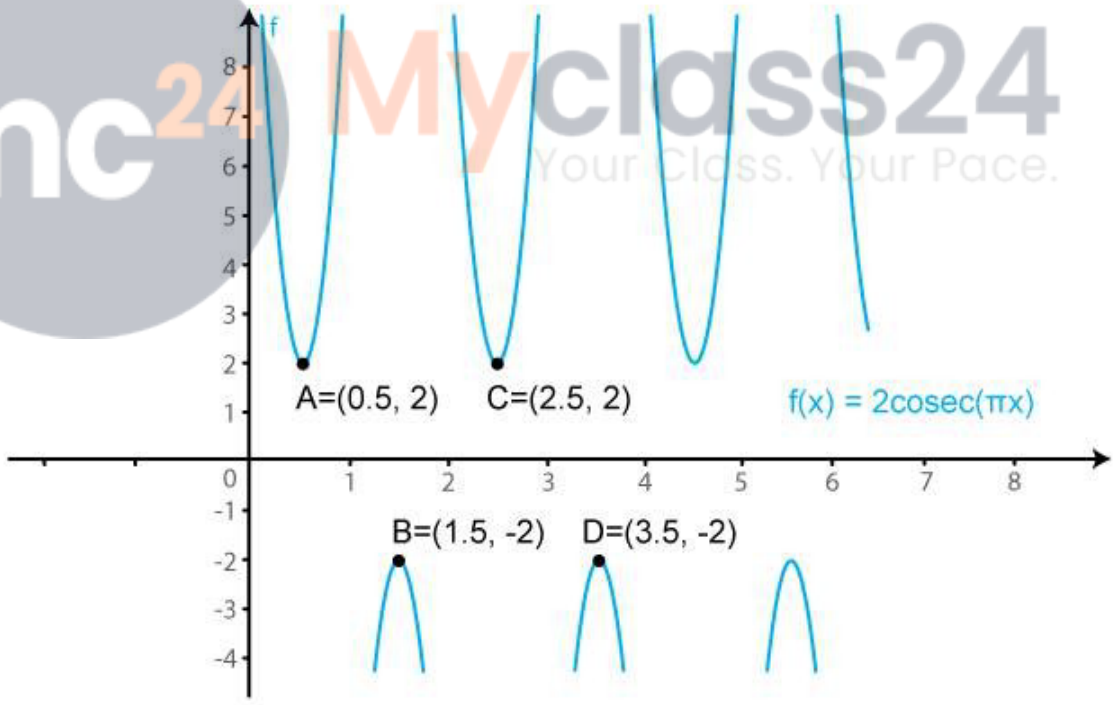
Solution:

We know that f (x) = cosec x is a periodic function with period 2π.

So, f (x) = 2 cosec (πx) is a periodic function with period 2. So, we will draw the graph of f (x) = 2 cosec (πx) in the interval [0, 2]. The values of f (x) = 2 cosec (πx) 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 cosec (πx)	∞	2	∞	-∞	-2	-∞	∞	2

The required curve is:



2. f (x) = 3 sec x

Solution:

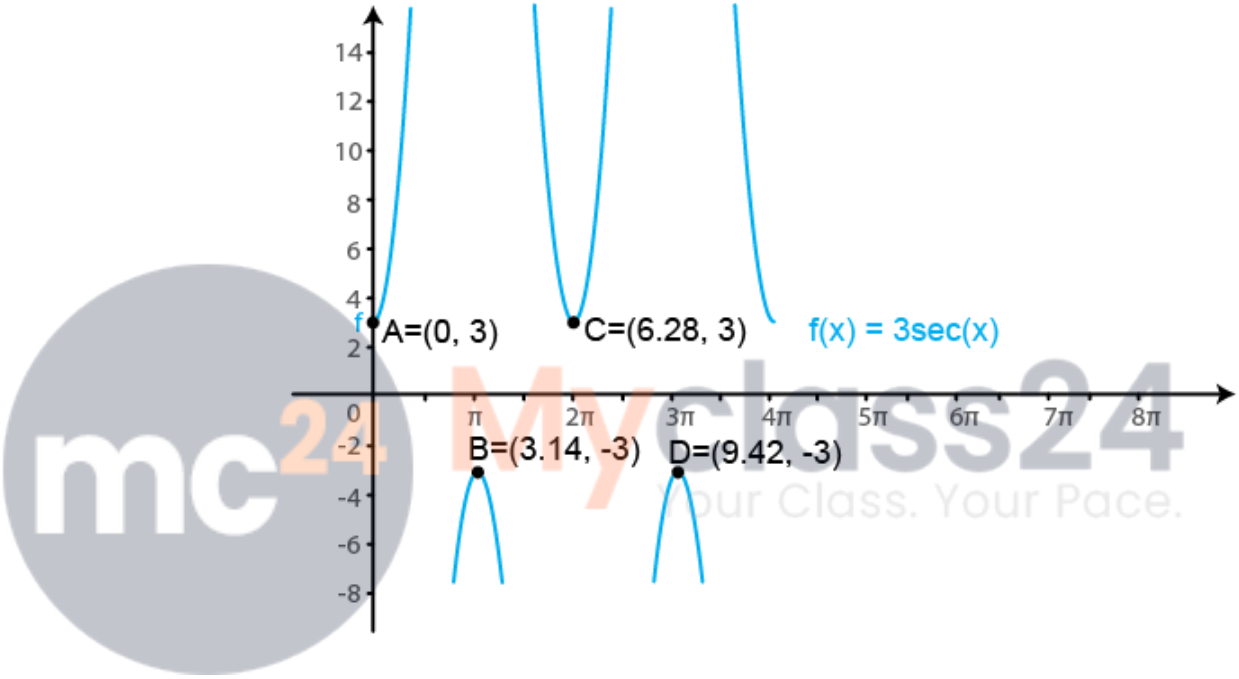
We know that f (x) = sec x is a periodic function with period π.

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

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

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

The required curve is:



3. f (x) = cot 2x

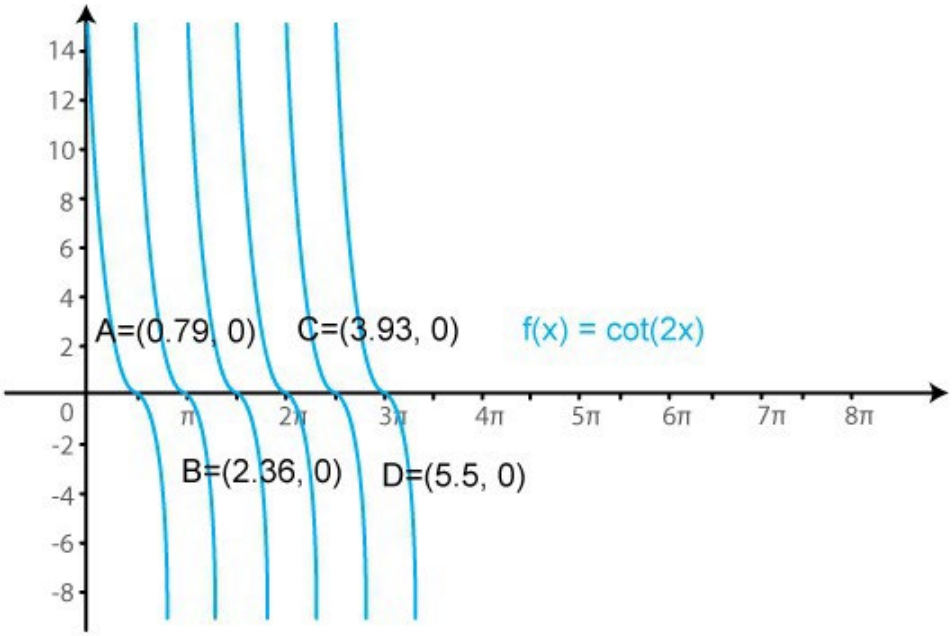
Solution:

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, π]. The values of f (x) = cot (2x) at various points in [0, π] are listed in the following table:

x	0 (A)	π/4 (B)	-π/2 (C)	π/2 (D)	3π/4 (E)	-π (F)
f (x) = cot x	→∞	0	-∞	→∞	0	-∞

The required curve is:



4. f (x) = 2 sec πx

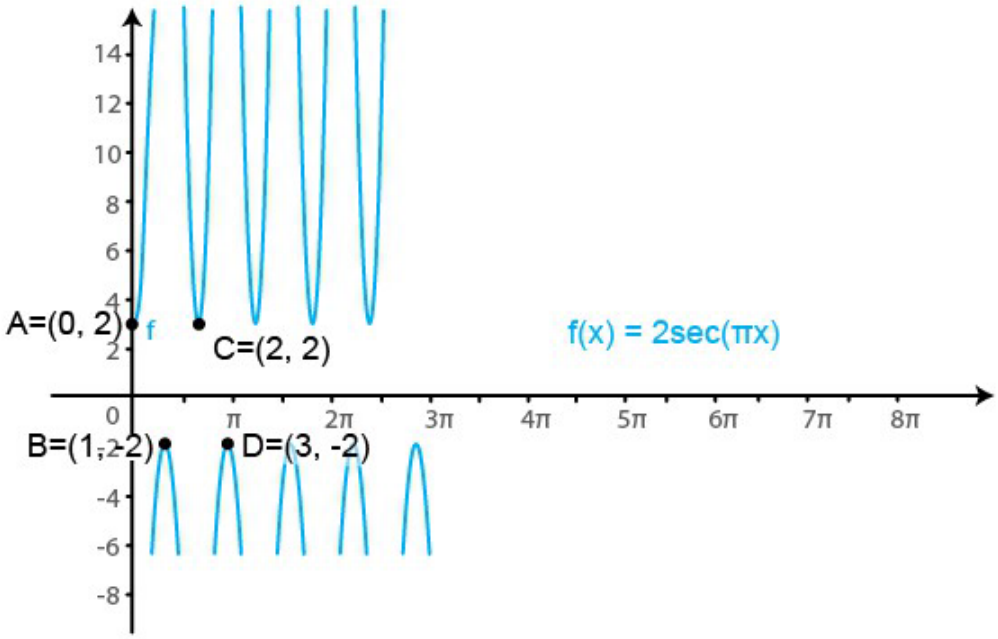
Solution:

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

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

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

The required curve is: