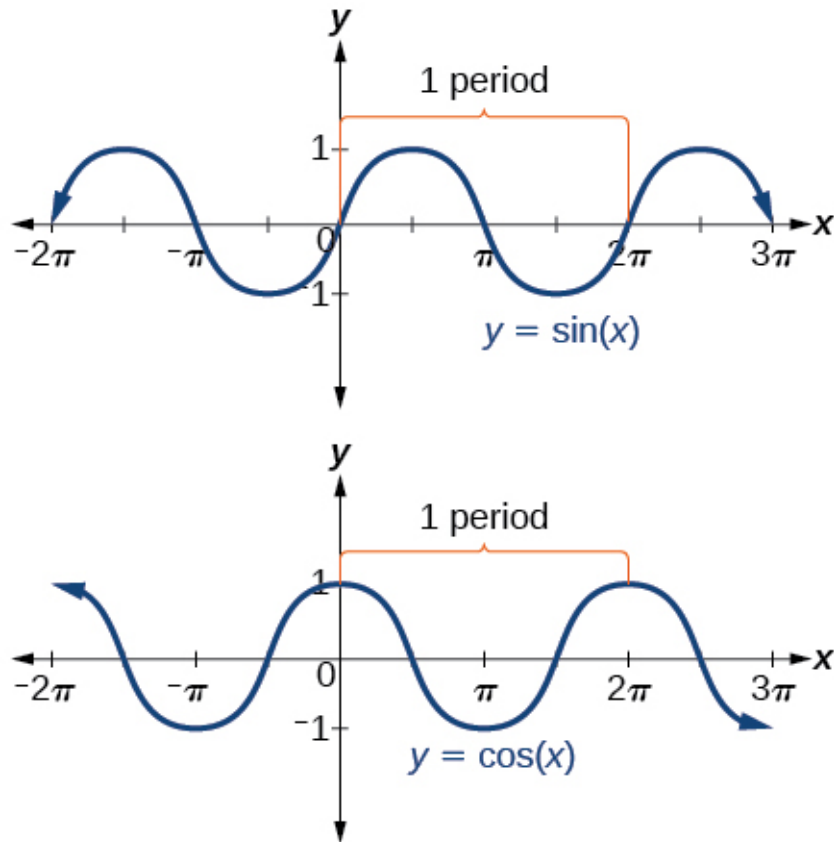


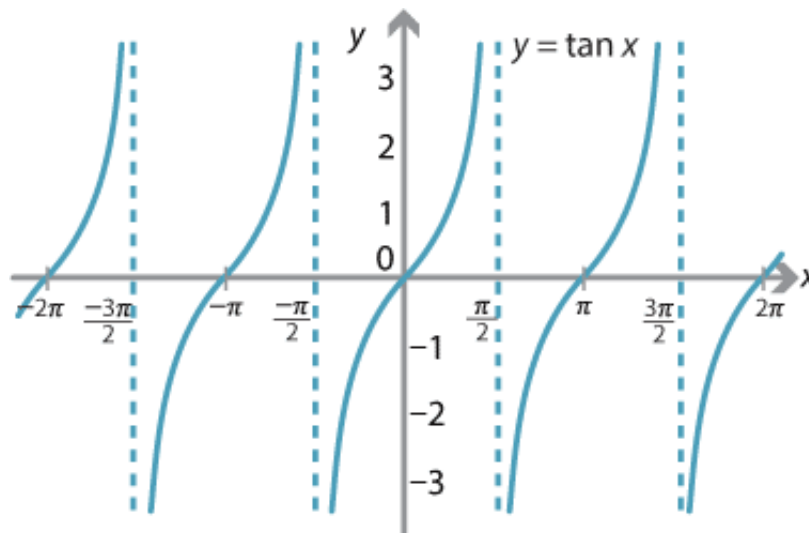
Solutions

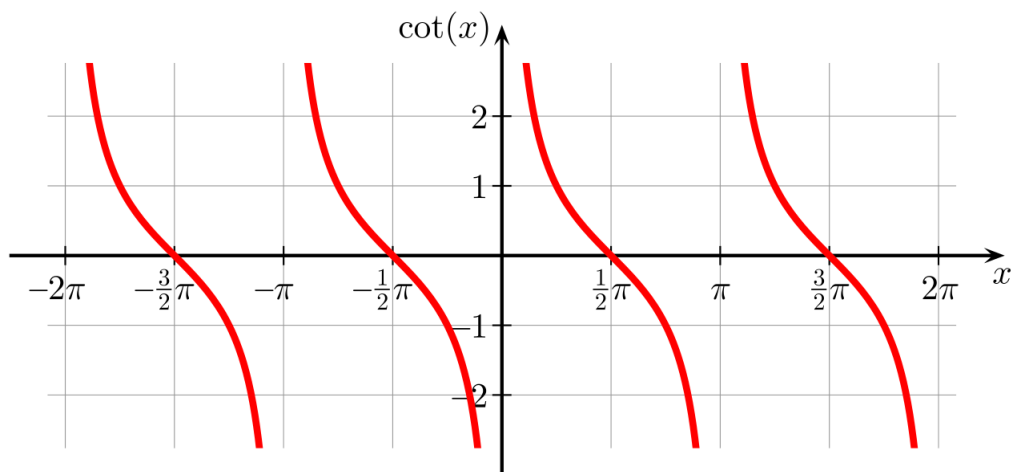
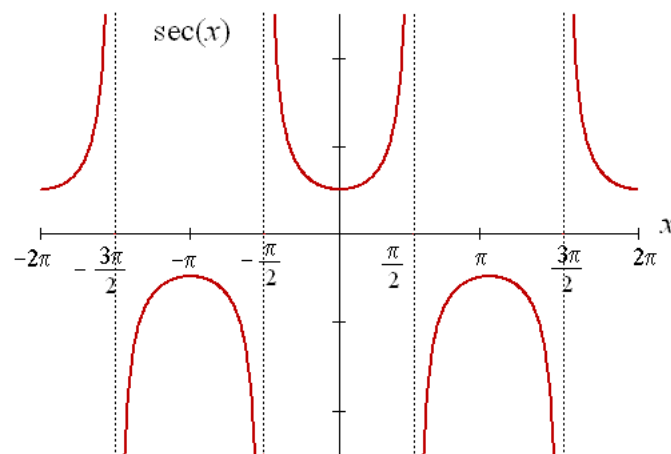
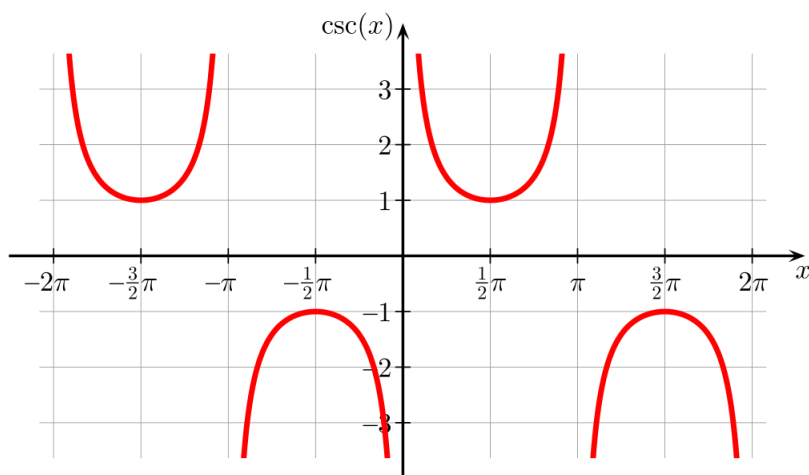
THEORETICAL PART:

Definition (Graphs of Cosine and Sine functions):



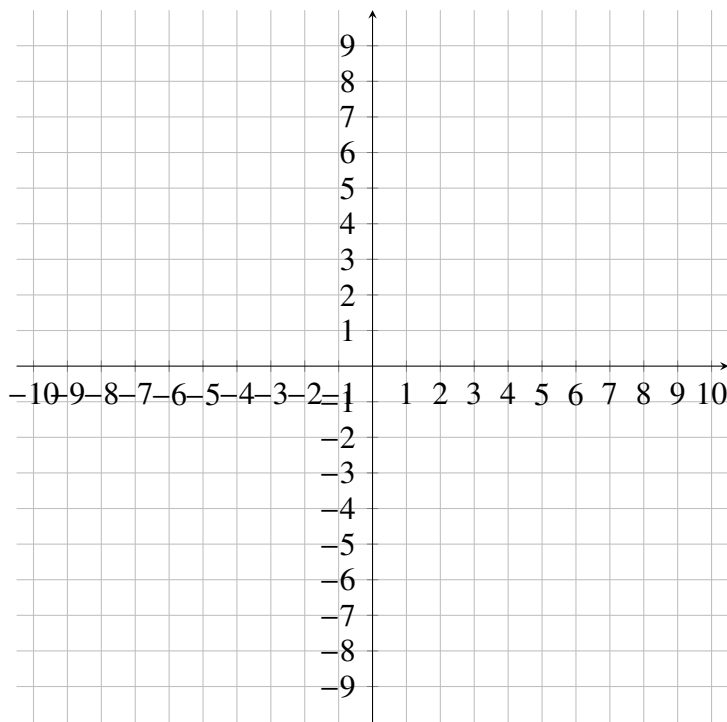
Definition (Graph of a Tangent function):



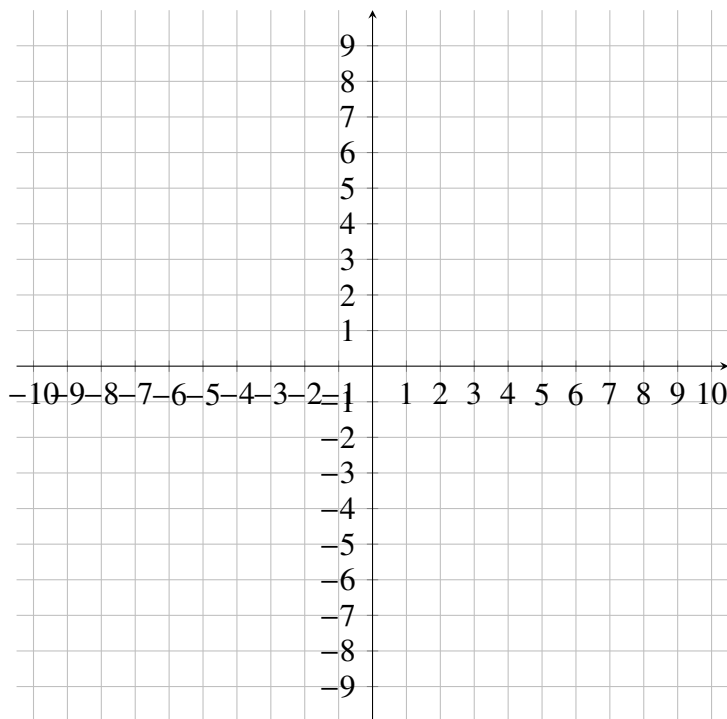
Definition (Graph of a Cotangent function):**Definition (Graph of a Secant function):****Definition (Graph of a Cosecant function):**

PRACTICAL PART:

1. Sketch the graph of $f(x) = 1 + 3 \tan(x)$.



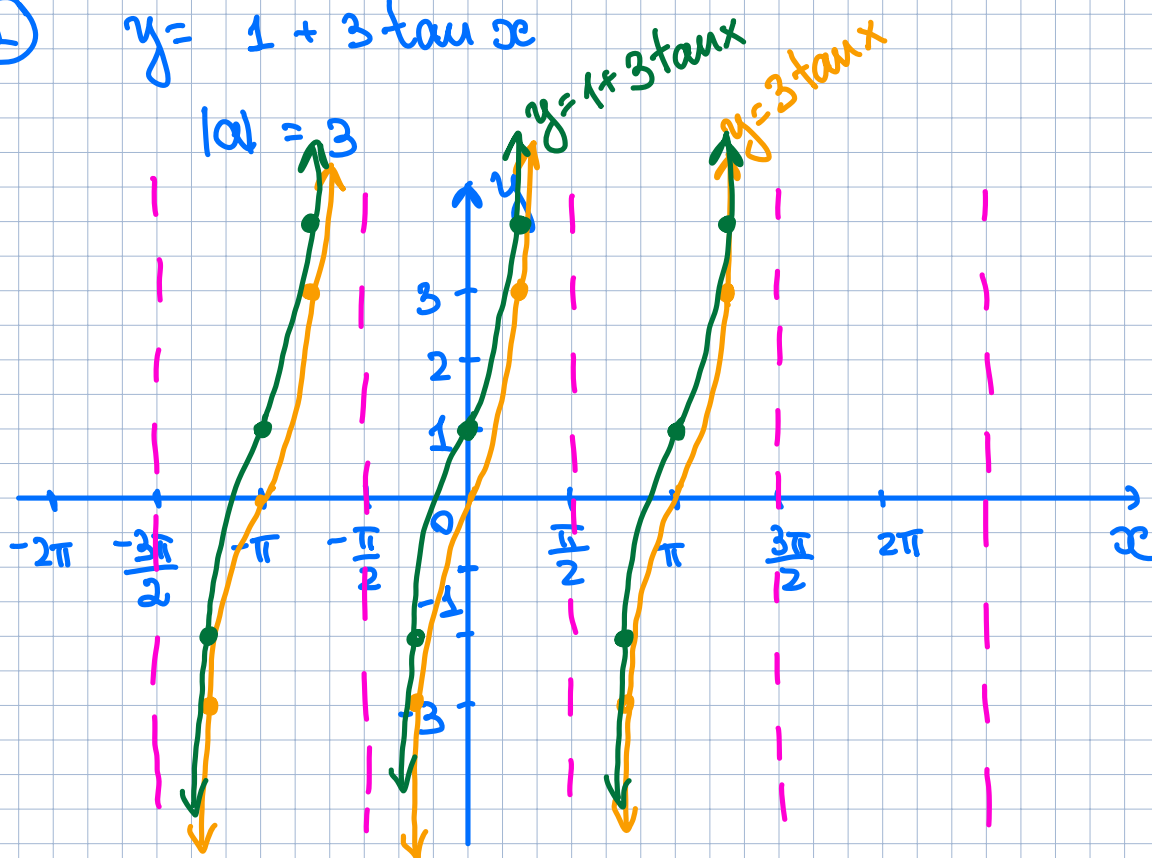
2. Sketch the graph of $f(x) = \tan\left(\frac{\pi x}{4} - \frac{\pi}{2}\right)$



①

$$y = 1 + 3 \tan x$$

$$|a| = 3$$



②

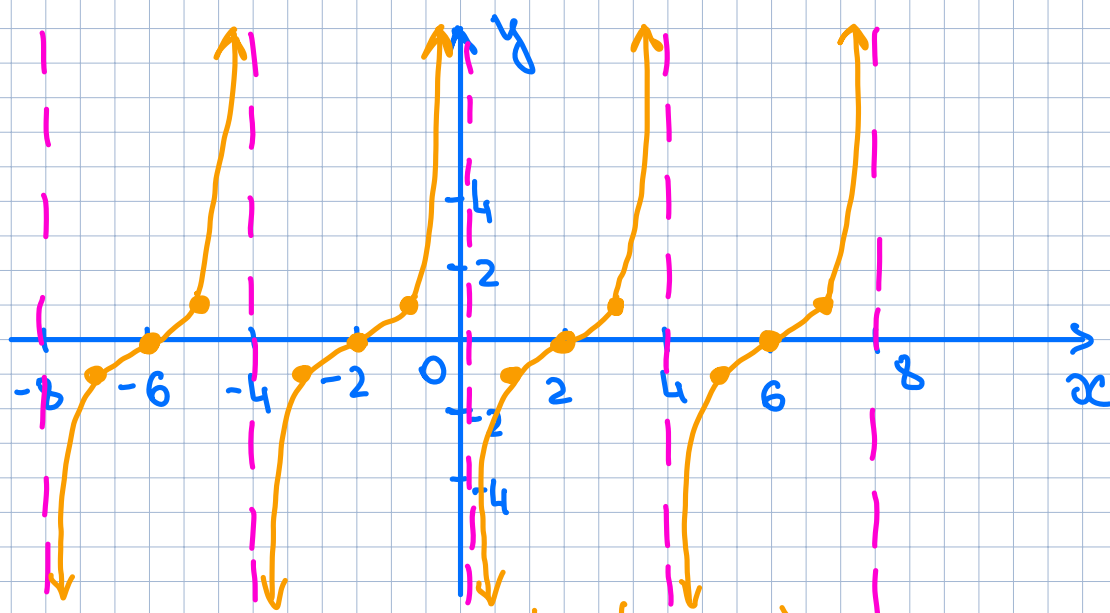
$$y = \tan \left(\frac{\pi x}{4} - \frac{\pi}{2} \right)$$

Asymptotes: $\frac{\pi x}{4} - \frac{\pi}{2} = -\frac{\pi}{2}$

$$\frac{\pi x}{4} - \frac{\pi}{2} = \frac{\pi}{2}$$

$$\frac{\pi x}{4} = 0, x = 0$$

$$\frac{\pi x}{4} = \pi, x = 4$$

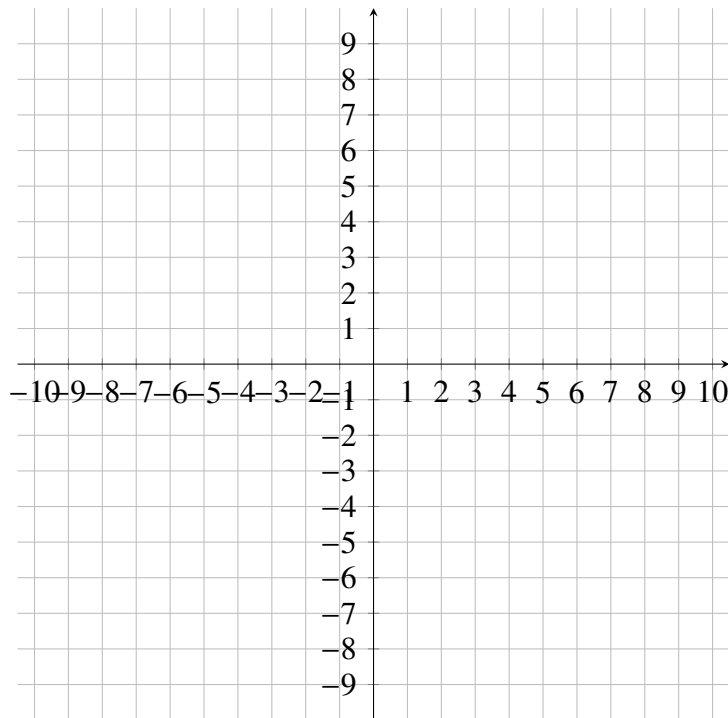


$$y = \tan\left(\frac{\pi x}{4} - \frac{\pi}{2}\right)$$

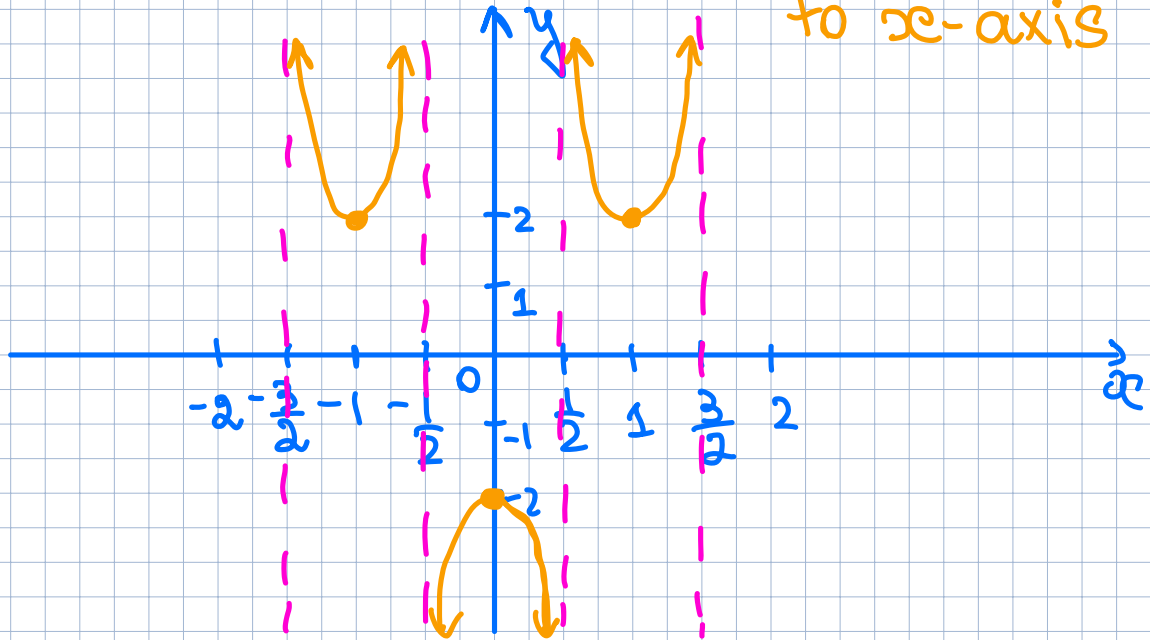
$$x = 3$$

$$y = \tan\left(\frac{3\pi}{4} - \frac{\pi}{2}\right) = \tan\left(\frac{3\pi - 2\pi}{4}\right) = \tan\left(\frac{\pi}{4}\right) = 1$$

3. Sketch the graph of $f(x) = -2 \csc\left(\pi x + \frac{\pi}{2}\right)$



③ $y = -2 \csc\left(\pi x + \frac{\pi}{2}\right)$ vertical stretching + reflecting with respect to x -axis



$$\pi x + \frac{\pi}{2} = 0, \quad x = -\frac{1}{2}$$

$$\pi x + \frac{\pi}{2} = \pi, \quad x = \frac{1}{2}$$

If $x = \frac{1}{4}$, then $\csc\left(\frac{1}{4} + \frac{\pi}{2}\right) =$
 $= \csc\left(\frac{3\pi}{4}\right)$