

Graphing Secant and Cosecant

Graph each function. State the amplitude, period, phase shift, vertical shift, asymptotes, domain, and range.

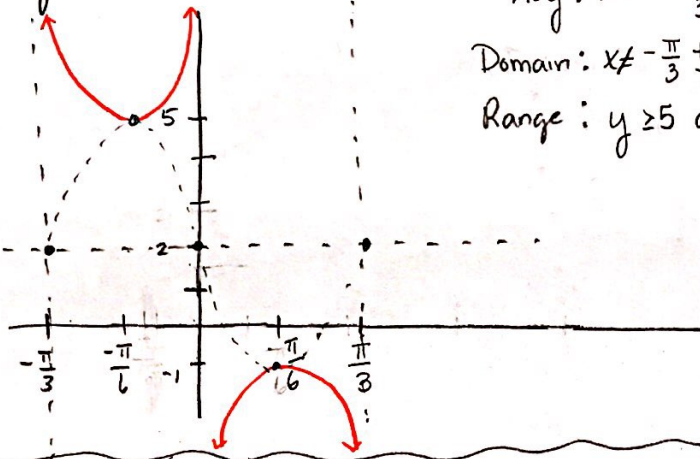
1. $y = 3\csc(3\theta + \pi) + 2$ Amp: n/A Period: $\frac{2\pi}{3}$ PS: $-\frac{\pi}{3}$ VS: 2

$y = 3\csc\left[3\left(\theta + \frac{\pi}{3}\right)\right] + 2$

Asy: $x = -\frac{\pi}{3}, x = 0, x = \frac{\pi}{3}$

Domain: $x \neq -\frac{\pi}{3} \pm \frac{\pi}{3}n$

Range: $y \geq 5$ and $y \leq -1$

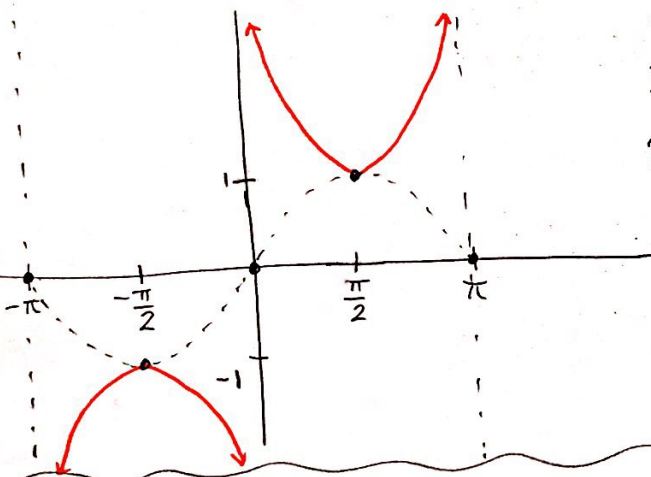


2. $y = -\csc(\theta + \pi)$ Amp: n/a Per: 2π PS: $-\pi$ VS: 0

Asy: $x = -\pi, x = 0, x = \pi$

Domain: $x \neq -\pi \pm \pi n$

Range: $y \geq 1$ and $y \leq -1$



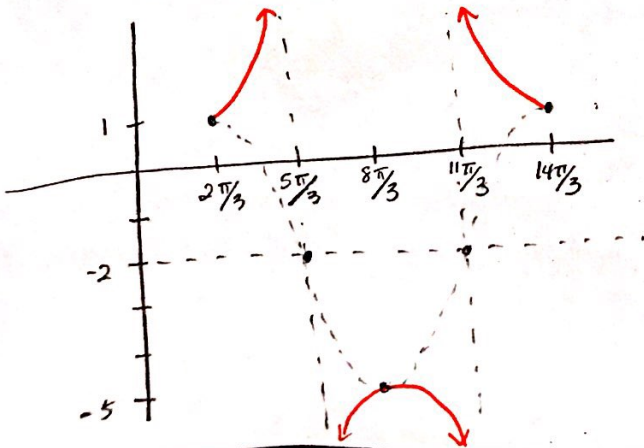
3. $f(\theta) = 3\sec\left(\frac{\theta}{2} - \frac{\pi}{3}\right) - 2$ Amp: n/A Per: $\frac{2\pi}{1/2} = 4\pi$ PS: $\frac{2\pi}{3}$ VS: -2

$f(\theta) = 3\sec\left[\frac{1}{2}\left(\theta - \frac{2\pi}{3}\right)\right] - 2$

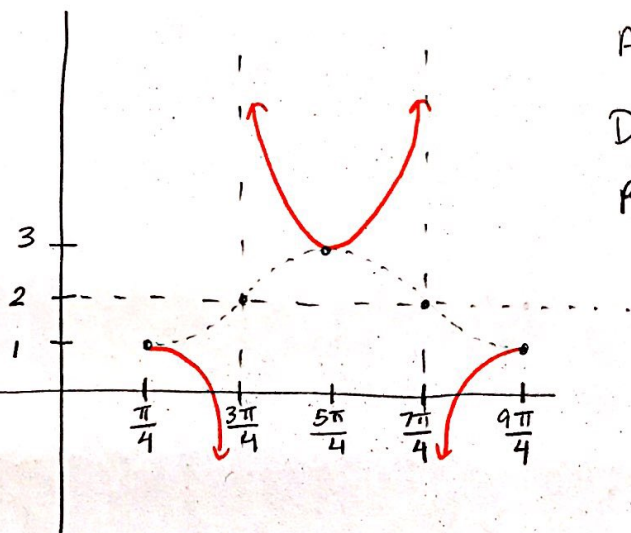
Asy: $x = \frac{5\pi}{3}, x = \frac{11\pi}{3}$

Domain: $x \neq \frac{5\pi}{3} \pm 2\pi n$

Range: $y \geq 1$ and $y \leq -5$



4. $y = 2 - \sec\left(\theta - \frac{\pi}{4}\right)$ Amp: n/a Per: 2π PS: $\frac{\pi}{4}$ VS: 2

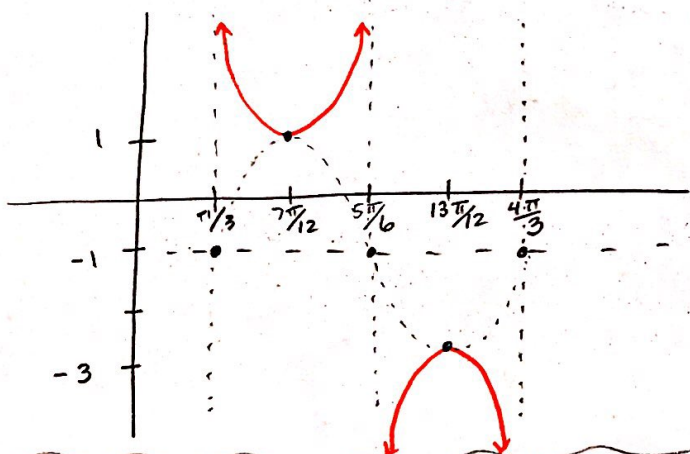


Asy: $x = \frac{3\pi}{4}$ and $x = \frac{7\pi}{4}$

Domain: $x \neq \frac{3\pi}{4} \pm \pi n$

Range: $y \geq 3$ and $y \leq 1$

5. $f(x) = -1 + 2\csc\left(2x - \frac{2\pi}{3}\right)$
 $f(x) = -1 + 2\csc\left[2\left(x - \frac{\pi}{3}\right)\right]$



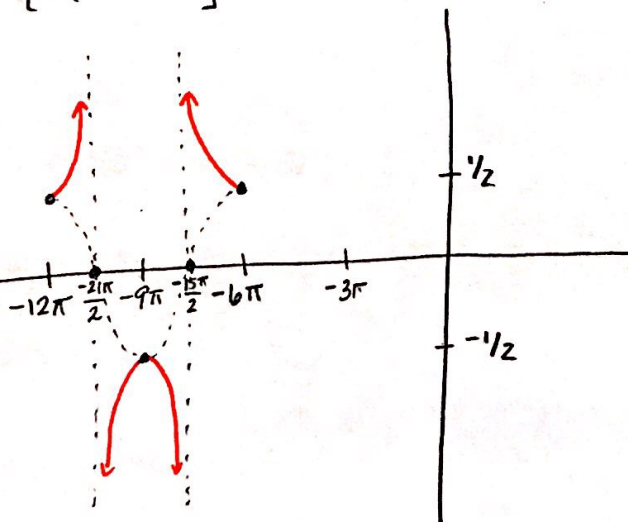
Amp: n/a Per: π PS: $\frac{\pi}{3}$ VS: -1

Asy: $x = \frac{\pi}{3}$, $x = \frac{5\pi}{6}$, $x = \frac{4\pi}{3}$

Domain: $x \neq \frac{\pi}{3} \pm \frac{\pi}{2} n$

Range: $y \geq 1$ and $y \leq -3$

6. $y = \frac{1}{2}\sec\left(\frac{x}{3} + 4\pi\right)$
 $y = \frac{1}{2}\sec\left[\frac{1}{3}(x + 12\pi)\right]$



Amp: n/a Per: 6π PS: -12π VS: 0

Asy: $x = -\frac{21\pi}{2}$ and $x = -\frac{15\pi}{2}$

Domain: $x \neq -\frac{21\pi}{2} + 3\pi n$

Range: $y \geq \frac{1}{2}$ and $y \leq -\frac{1}{2}$