

Sketch the graph. Determine b, the period, phase shift, vertical shift, 2 specific asymptotes, the asym equation, domain and range.

$$\sin \theta = \frac{1}{2} \quad \theta = \frac{\pi}{6}, \frac{5\pi}{6}$$

5.) $y = -2 \csc \theta - 2$

$$y = -2 \sin \theta - 2$$

6.) $y = \sec 2\theta + 2$

$$y = \cos 2\theta + 2$$

b = 1 Period: 2π Phase Shift: none

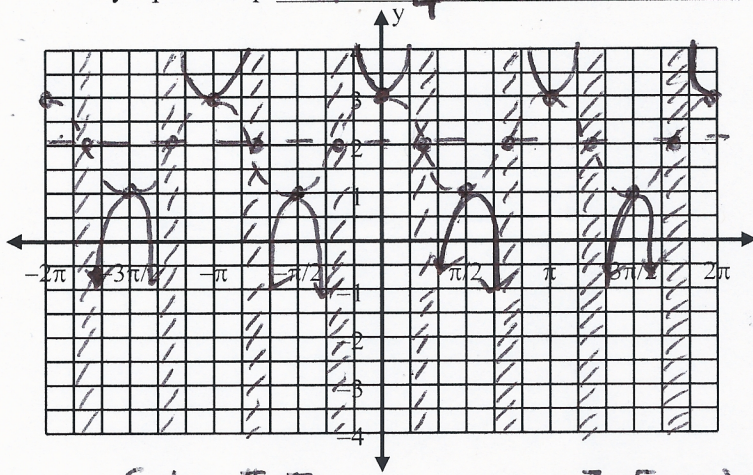
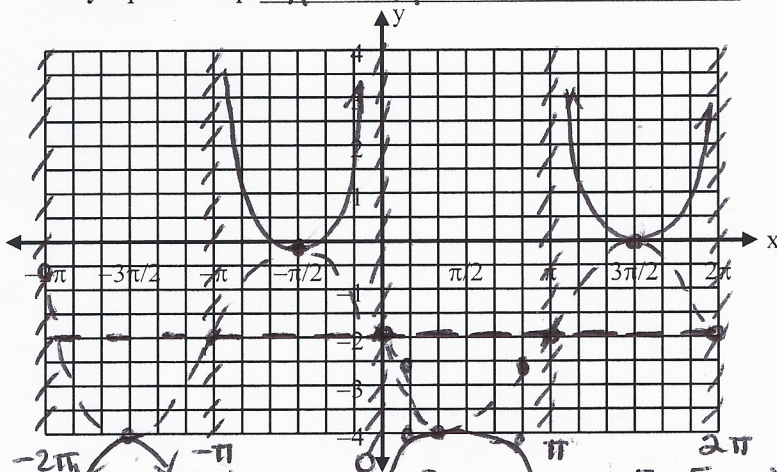
b = 2 Period: π Phase shift: none

V. Shift: $2\downarrow$ 2 asym: $x = \pi, -\pi$

V. Shift: $2\uparrow$ 2 asym: $\frac{\pi}{4}, \frac{3\pi}{4}$

Asymptote Eq: $x = \pi n$

Asymptote Eq: $x = \frac{\pi}{4} + \frac{\pi n}{2}$



Domain: $\{x | x \neq \pi n, n \in \mathbb{Z}\}$ Range: $(-\infty, -4] \cup [0, \infty)$ Domain: $\{x | x \neq \frac{\pi}{4} + \frac{\pi n}{2}, n \in \mathbb{Z}\}$ Range: $(-\infty, 1] \cup [3, \infty)$

7.) $y = -2 \sec(\theta + \frac{\pi}{6})$ $y = -2 \cos(\theta + \frac{\pi}{6})$

8.) $y = \sec(\theta - \frac{\pi}{3}) - 2$ $y = \cos(\theta - \frac{\pi}{3}) - 2$

b = 1 Period: 2π Phase Shift: $\frac{\pi}{6}$ ←

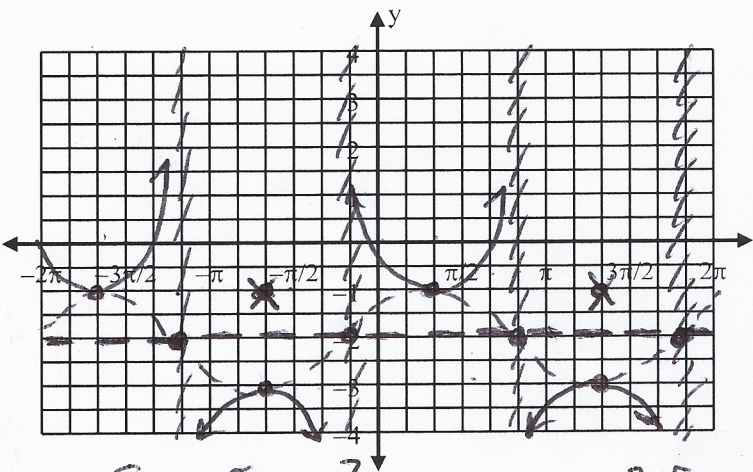
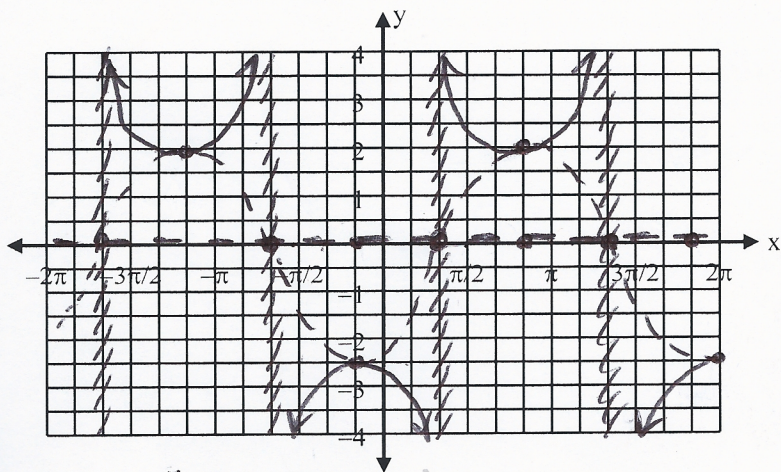
b = 1 Period: 2π Phase shift: _____

V. Shift: none 2 asym: $\frac{\pi}{3}, \frac{4\pi}{3}$

V. Shift: $2\downarrow$ 2 asym: $x = -\frac{\pi}{6}, x = \frac{5\pi}{6}$

Asymptote Eq: $x = \frac{\pi}{3} + \pi n$

Asymptote Eq: $x = -\frac{\pi}{6} + \pi n$ OR $x = \frac{5\pi}{6} + \pi n$



Domain: $\{x | x \neq \frac{\pi}{3} + \pi n, n \in \mathbb{Z}\}$ Range: $(-\infty, -2] \cup [2, \infty)$ Domain: $\{x | x \neq \frac{5\pi}{6} + \pi n\}$ Range: $(-\infty, -3] \cup [1, \infty)$

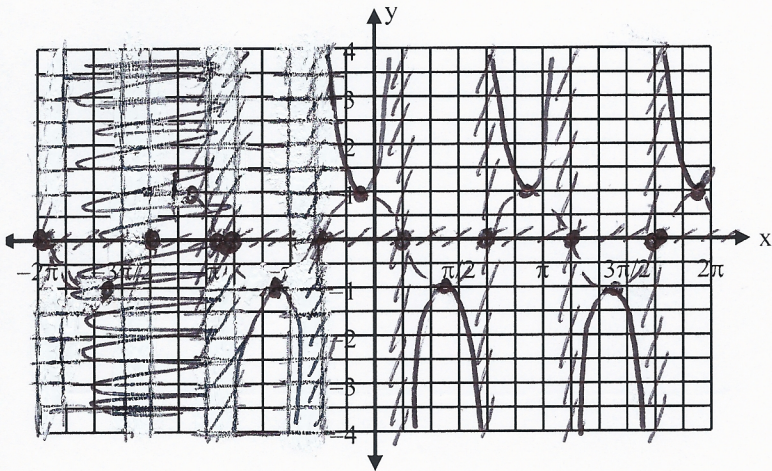
$$\frac{3\pi}{6} = \frac{4\pi}{3}$$

9.) $y = \csc 2(\theta + \frac{\pi}{3})$ $y = \sin 2(\theta + \frac{\pi}{2})$

$b = 2$ Period: π Phase Shift: $\frac{\pi}{2} \leftarrow$

V. Shift: none 2 asym: $x = \frac{\pi}{6}, \frac{2\pi}{3}$

Asymptote Eq: $x = \frac{\pi}{6} + \frac{\pi n}{2}$



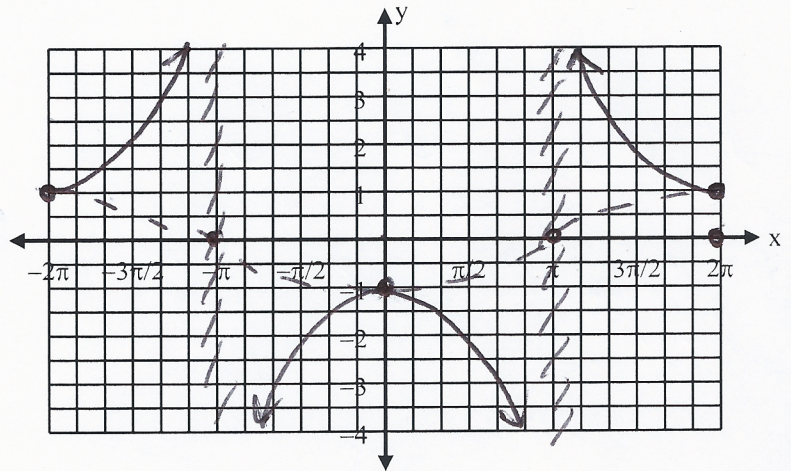
Domain: $\{x | x \neq \frac{\pi}{6} + \frac{\pi n}{2}\}$ Range: $(-\infty, -1] \cup [1, \infty)$

10.) $y = -\sec \frac{1}{2}\theta$ $y = -\cos \frac{1}{2}\theta$

$b = \frac{1}{2}$ Period: 4π Phase shift: none

V. Shift: none 2 asym: $\pi, -\pi$

Asymptote Eq: $x = \pi + 2\pi n$



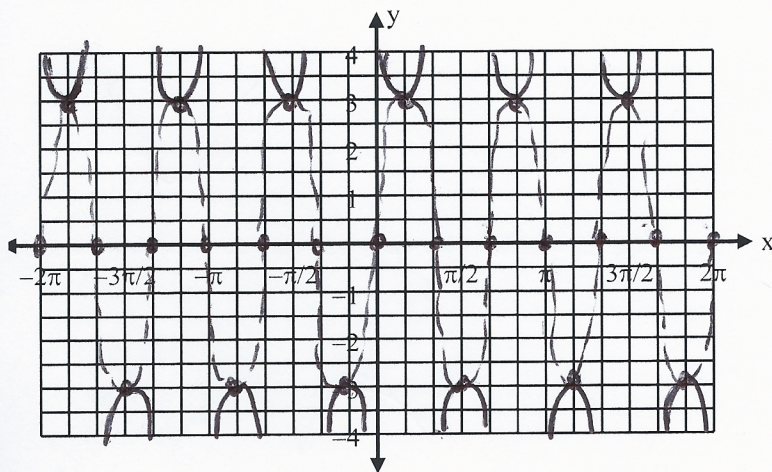
Domain: $\{x | x \neq \pi + 2\pi n\}$ Range: $(-\infty, -1] \cup [1, \infty)$
 $n \in \mathbb{Z}$

11.) $y = 3 \csc 3\theta$ $y = 3 \sin 3\theta$

$b = 3$ Period: $\frac{2\pi}{3}$ Phase Shift: none

V. Shift: none 2 asym: $x = \frac{\pi}{3}, \frac{5\pi}{6}$

Asymptote Eq: $x = \frac{\pi}{3} n$



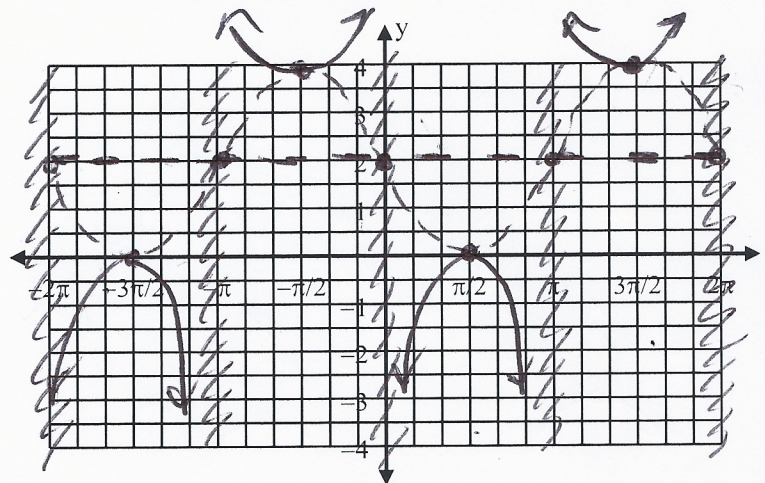
Domain: $\{x | x \neq \frac{\pi}{3} n\}$ Range: $(-\infty, -3] \cup [3, \infty)$
 $n \in \mathbb{Z}$

12.) $y = -2 \csc(\theta) + 2$ $y = -2 \sin \theta + 2$

$b = 1$ Period: 2π Phase shift: none

V. Shift: 2 up 2 asym: $x = 0, \pi, 2\pi$

Asymptote Eq: $x = \pi n$



Domain: $\{x | x \neq \pi n\}$ Range: $(-\infty, 0] \cup [4, \infty)$
 $n \in \mathbb{Z}$