Graphing Tangent and Cotangent with Phase Shift

$$y = atan[k(x-b)],\ k > 0$$

Period $p = \frac{\pi}{k}$

Phase Shift b

Interval of One Cycle $=\left(b - \frac{\pi}{2k}, b + \frac{\pi}{2k}\right)$

Vertical Asymptotes $x = b - \frac{\pi}{2k}$ and $x = b + \frac{\pi}{2k}$

$$y = acot[k(x-b)],\ k > 0$$

Period $p = \frac{\pi}{k}$

Phase Shift b

Interval of One Cycle $=\left(b, b + \frac{\pi}{k}\right)$

Vertical Asymptotes $x = b$ and $x = b + \frac{\pi}{k}$

Determine the period, phase shift, and interval of one cycle, x-int, vertical asymptotes.

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

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

3. $y = \cot\left(x + \frac{\pi}{6}\right)$

4. $y = \cot\left(x - \frac{\pi}{3}\right)$

5. $y = cot(4x + \pi)$

6. $y = \cot(6x - \pi)$

7. $y = -4tan\left[3\left(x - \frac{\pi}{2}\right)\right]$

8. $y = -3tan\left[2\left(x + \frac{\pi}{4}\right)\right]$

9. $y = \frac{1}{2} cot\left[\frac{1}{3}(x + \pi)\right]$

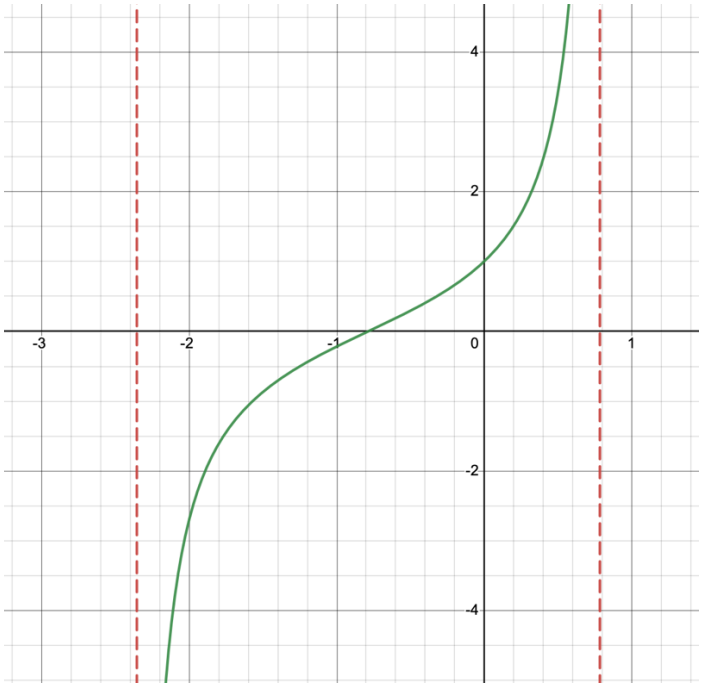
10. $y = \frac{3}{4} cot\left[\frac{1}{4}(x - \pi)\right]$

11. $y = -tan\left[\frac{1}{2}\left(x - \frac{\pi}{3}\right)\right]$

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

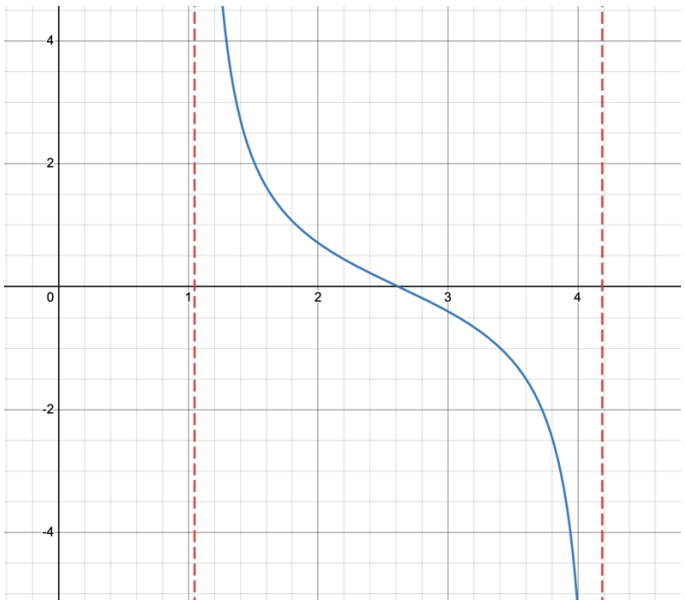
Answers

2.



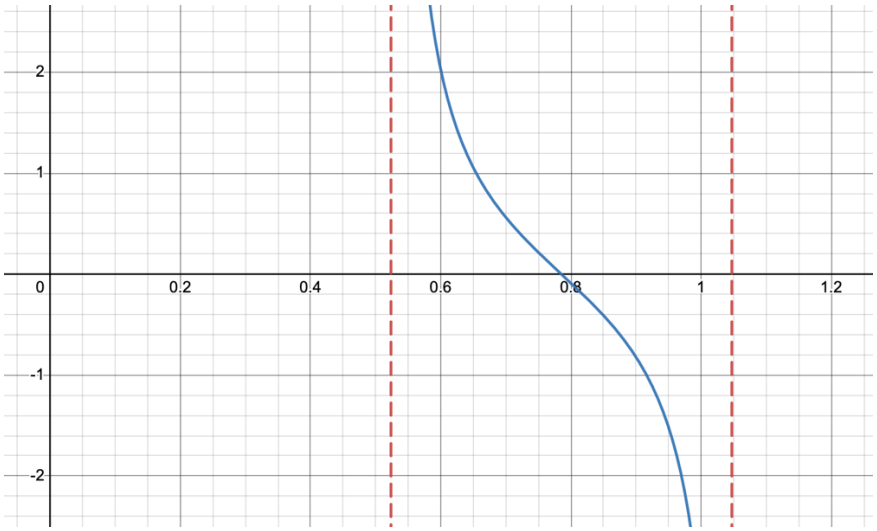
Period= π, Phase= $-\frac{\pi}{4}$, Interval=$\left(-\frac{3\pi}{4},\frac{\pi}{4}\right)$, VA: $x=-\frac{3\pi}{4}, x=\frac{\pi}{4}$, x-int: $x=-\frac{\pi}{4}$

4.



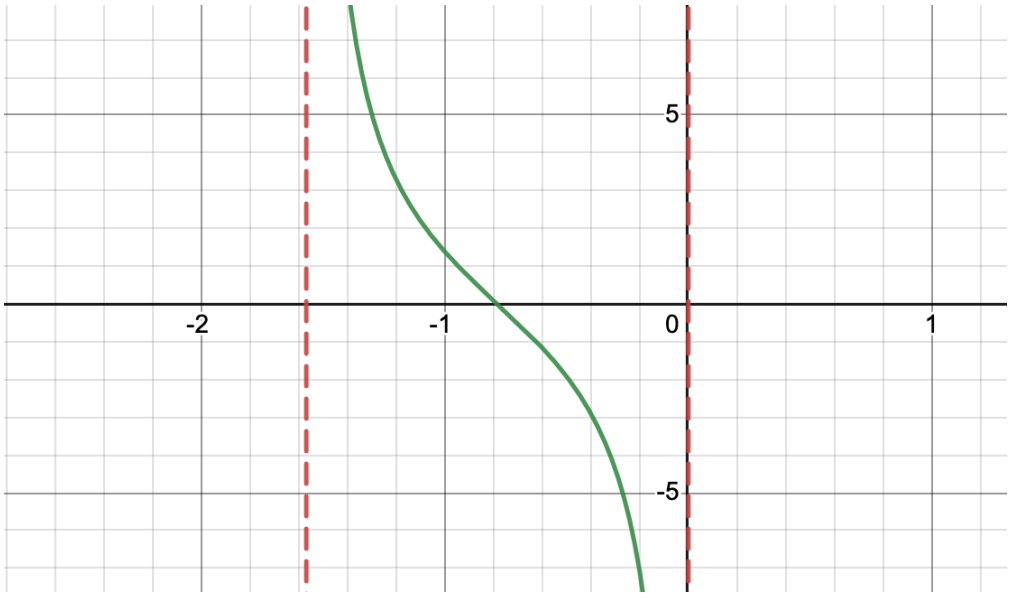
Period= π, Phase= $\frac{\pi}{3}$, Interval=$\left(\frac{\pi}{3},\frac{4\pi}{3}\right)$, VA: $x=\frac{\pi}{3}, x=\frac{4\pi}{3}$, x-int: $x=\frac{5\pi}{6}$

6.



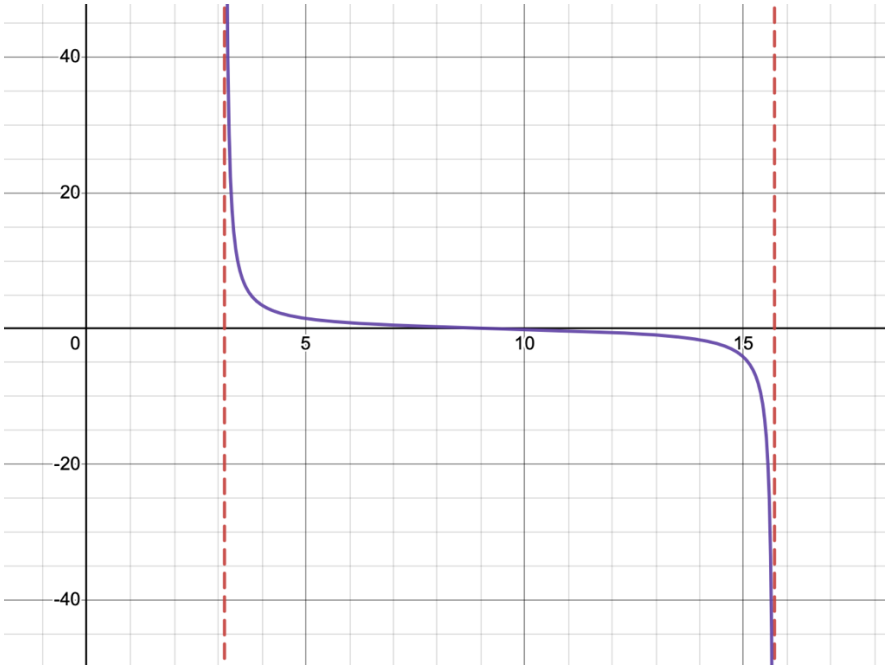
Period= $\frac{\pi}{6}$, Phase= $\frac{\pi}{6}$, Interval= $\left(\frac{\pi}{6}, \frac{\pi}{3}\right)$, VA: $x = \frac{\pi}{6}, x = \frac{\pi}{3}$, x-int: $x = \frac{\pi}{4}$

8.



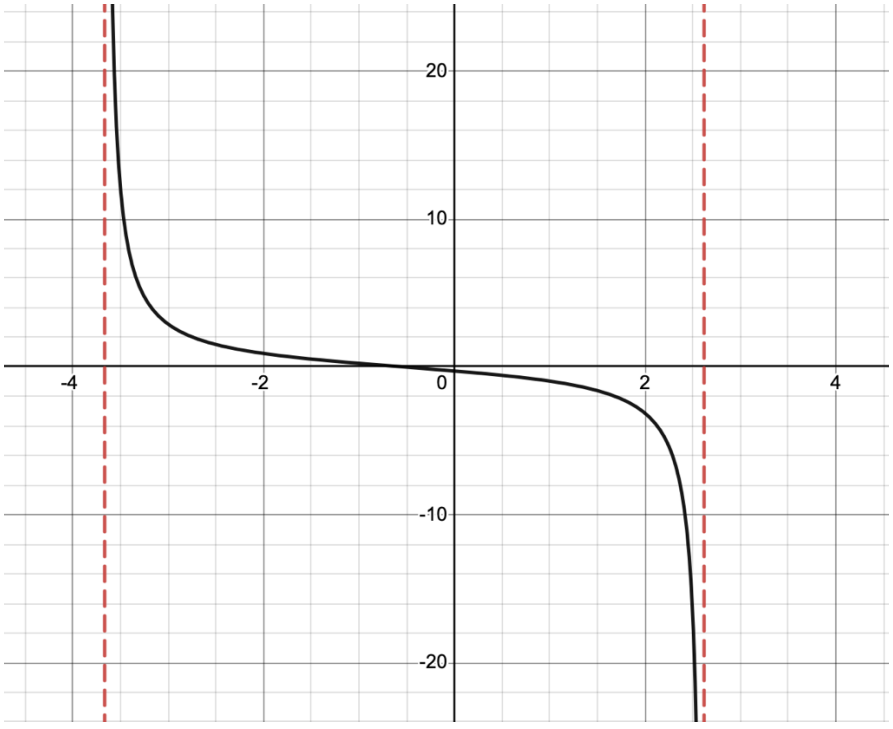
Period= $\frac{\pi}{2}$, Phase= $-\frac{\pi}{4}$, Interval= $\left(-\frac{\pi}{2}, 0\right)$, VA: $x = -\frac{\pi}{2}, x = 0$, x-int: $x = -\frac{\pi}{4}$

10.



Period=4π, Phase=π, Interval=$(\pi, 5\pi)$, VA: $x = \pi, x = 5\pi$, x-int: $x = 3\pi$

12.



Period=2π, Phase= $-\frac{\pi}{6}$, Interval=$\left(-\frac{7\pi}{6}, \frac{5\pi}{6}\right)$, VA: $x = -\frac{7\pi}{6}, x = \frac{5\pi}{6}$, x-int: $x = -\frac{\pi}{6}$