Graphing Tangent and Cotangent

$$y = atan[kx]$$
$$k > 0$$

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

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

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

$$y = acot[kx]$$
$$k > 0$$

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

Interval of One Cycle $=\left(0, \frac{\pi}{k}\right)$

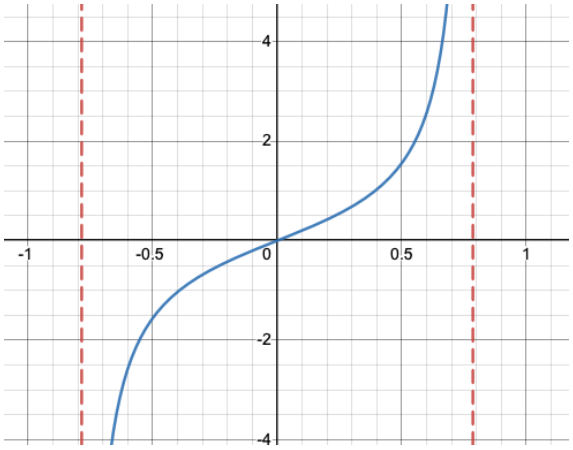
Vertical Asymptotes $x = 0$ and $x = \frac{\pi}{k}$

Determine the period, interval of one cycle, x-intercept, vertical asymptotes, and use the information to sketch the curve.

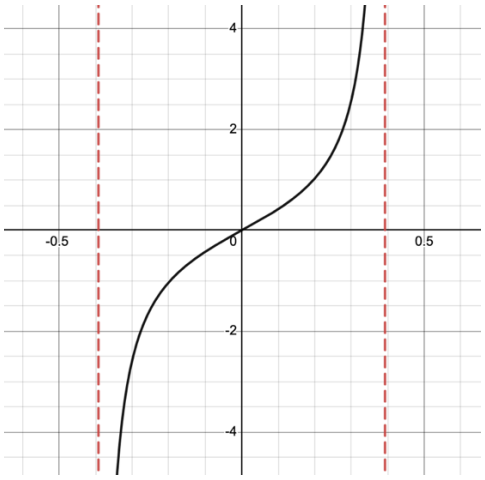
1. $y = tan(2x)$
2. $y = tan(4x)$
3. $y = \frac{1}{4}tan\left(\frac{x}{3}\right)$
4. $y = tan\left(\frac{x}{4}\right)$
5. $y = \frac{2}{3}\cot\left(\frac{1}{2}x\right)$
6. $y = cot\left(\frac{1}{3}x\right)$
7. $y = -\cot(2x)$
8. $y = -cot(3x)$
9. $y = -4tan(\pi x)$
10. $y = 3tan(2\pi x)$
11. $y = 2cot(3\pi x)$
12. $y = \frac{3}{2}cot(4\pi x)$
13. $y = 3tan\left(-\frac{x}{4}\right)$
14. $y = 2tan\left(-\frac{x}{6}\right)$

Answers

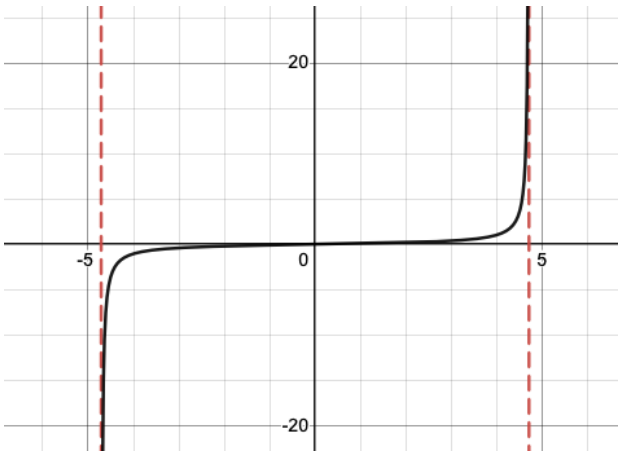
1. $P = \frac{\pi}{2}$, $Interval = (-\frac{\pi}{4}, \frac{\pi}{4})$, VA: $x = -\frac{\pi}{4}$ and $x = \frac{\pi}{4}$, x-intercept: $x = 0$



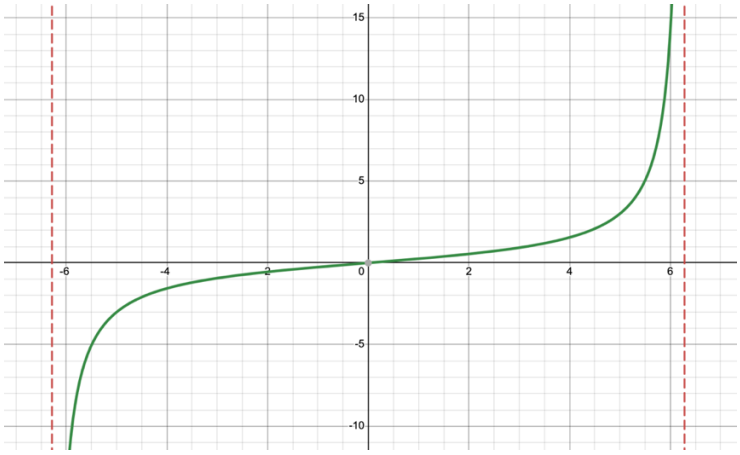
2. Period=$\frac{\pi}{4}$, Interval=$\left(-\frac{\pi}{8}, \frac{\pi}{8}\right)$, VA: $x = -\frac{\pi}{8}, x = \frac{\pi}{8}$, x-int: $x = 0$



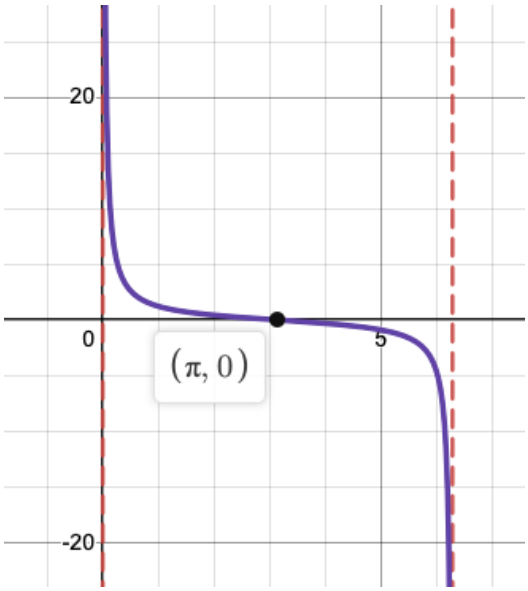
3. $P = 3\pi$, $Interval = (-\frac{3\pi}{2}, \frac{3\pi}{2})$, VA: $x = -\frac{3\pi}{2}$ and $x = \frac{3\pi}{2}$, x-intercept: $x = 0$



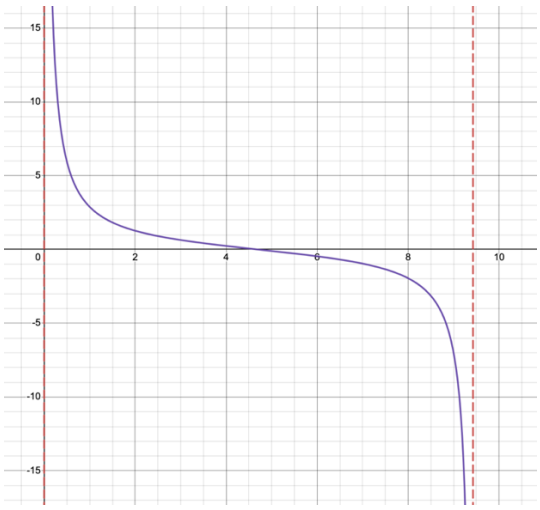
4. Period=4π, Interval=$(-2\pi, 2\pi)$, VA: $x = -2\pi, x = 2\pi$, x-int: $x = 0$



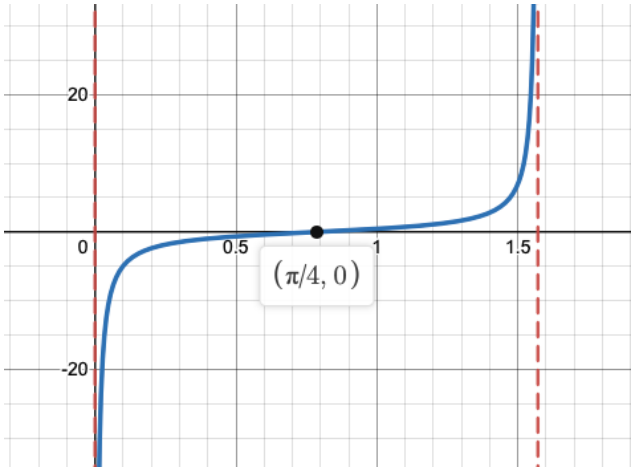
5. $P = 2\pi$, $Interval = (0,2\pi)$, VA: $x = 0$ and $x = 2\pi$, x-intercept: $x = \pi$



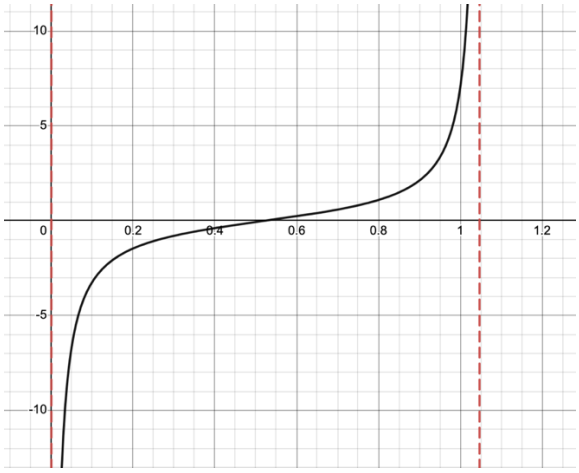
6. Period=3π, Interval=$(0,3\pi)$, VA: $x = 0, x = 3\pi$, x-int: $x = \frac{3\pi}{2}$



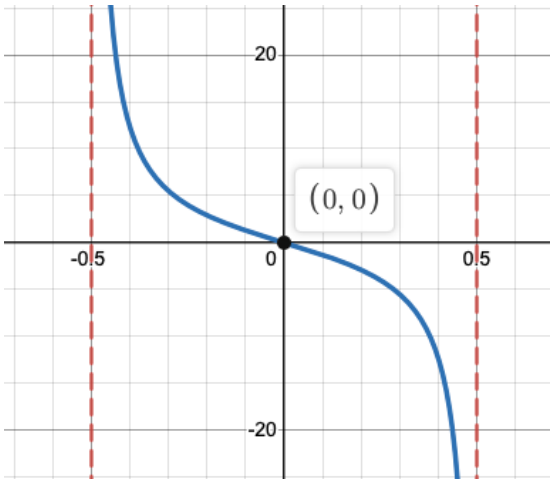
7. $P = \frac{\pi}{2}$, $Interval = (0, \frac{\pi}{2})$, VA: $x = 0$ and $x = \frac{\pi}{2}$, x-intercept: $x = \frac{\pi}{4}$



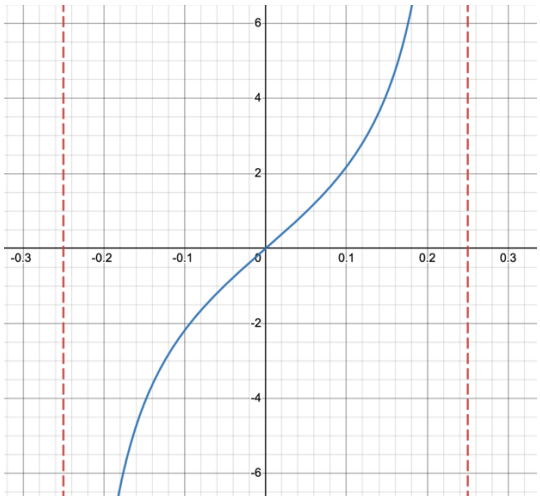
8. Period=$\frac{\pi}{3}$, Interval=$\left(0, \frac{\pi}{3}\right)$, VA: $x = 0, x = \frac{\pi}{3}$, x-int: $x = \frac{\pi}{6}$



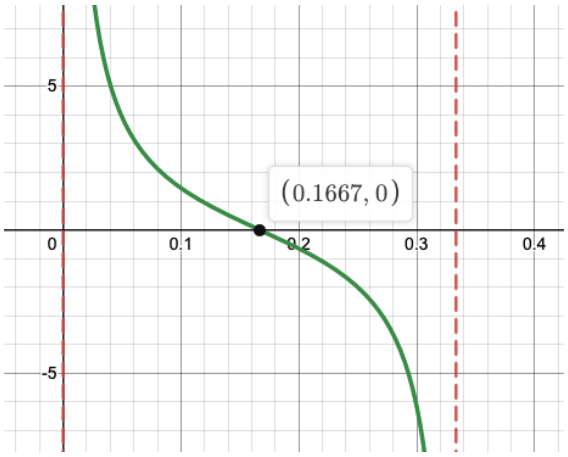
9. $P = 1$, $Interval = (-\frac{1}{2}, \frac{1}{2})$, VA: $x = -\frac{1}{2}$ and $x = \frac{1}{2}$, x-intercept: $x = 0$



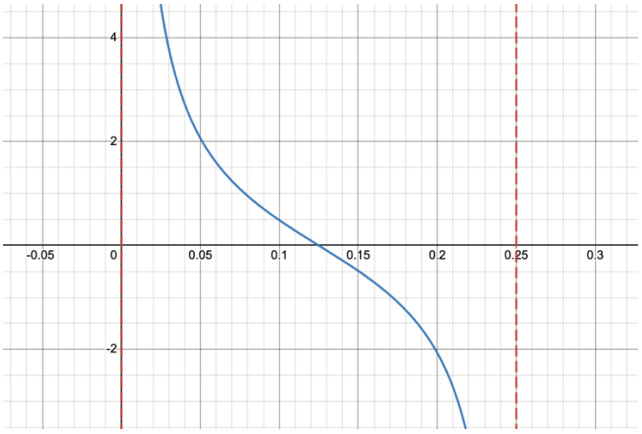
10. Period=$\frac{1}{2}$, Interval=$\left(-\frac{1}{4}, \frac{1}{4}\right)$, VA: $x = -\frac{1}{4}, x = \frac{1}{4}$, x-int: $x = 0$



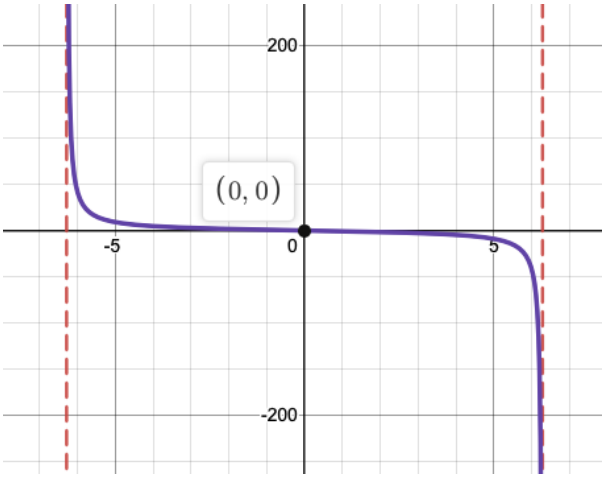
11. $P = \frac{1}{3}$, $Interval = (0, \frac{1}{3})$, VA: $x = 0$ and $x = \frac{1}{3}$, x-intercept: $x = \frac{1}{6}$



12. Period=$\frac{1}{4}$, Interval=$\left(0, \frac{1}{4}\right)$, VA: $x = 0, x = \frac{1}{4}$, x-int: $x = \frac{1}{8}$



13. $P = 4\pi$, $Interval = (-2\pi, 2\pi)$, VA: $x = -2\pi$ and $x = 2\pi$, x-intercept: $x = 0$



14. Period=6π, Interval=$(-3\pi, 3\pi)$, VA: $x = -3\pi, x = 3\pi$, x-int: $x = 0$