Activity 25 Secant

1. As θ changes from 0 to $\frac{\pi}{2}$, $\sec(\theta)$ changes from 1 to ∞.

2. $\sec(\theta)$ will be negative for $\frac{\pi}{2} < \theta < \frac{3\pi}{2}$

3.

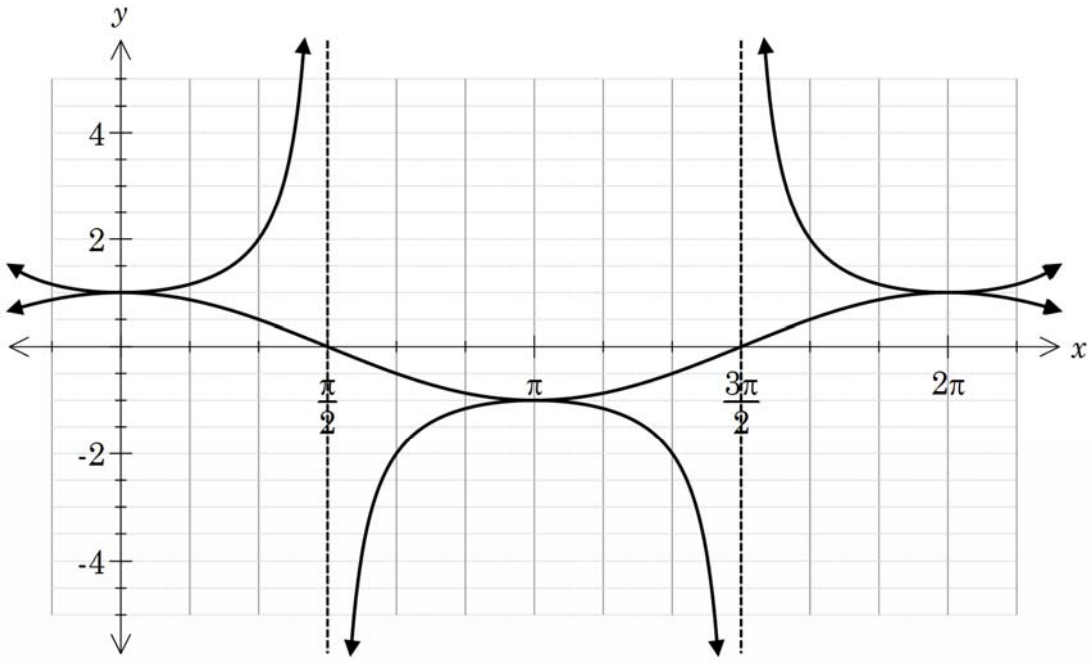
   a) Angle increment is $\frac{2\pi}{24} = \frac{\pi}{12}$

   b) $\sec\left(\frac{\pi}{3}\right) = \frac{1}{\cos\left(\frac{\pi}{3}\right)}$

   c) $\sec\left(\frac{2\pi}{3}\right) = \frac{1}{\cos\left(\frac{2\pi}{3}\right)}$

   d) $\sec(\theta) = \frac{1}{\cos(\theta)}$

4.



5. Since $\cos\left(\frac{\pi}{2}\right) = 0$, $\sec\left(\frac{\pi}{2}\right) = \frac{1}{\cos\left(\frac{\pi}{2}\right)} = \frac{1}{0}$ which is undefined.

6.

a) From ΔOAT, $\cos(\theta) = \dfrac{1}{\sec(\theta)}$

$$\therefore \sec(\theta) = \frac{1}{\cos(\theta)}$$

b) $\tan(\theta) = \dfrac{AT}{1}$

i.e. $AT = \tan(\theta)$

c) $1 + \tan^2(\theta) = \sec^2(\theta)$

d) R.T.P : $1 + \tan^2(\theta) = \sec^2(\theta)$

$$\begin{aligned} LHS &= 1 + \tan^2(\theta) \\ &= 1 + \frac{\sin^2(\theta)}{\cos^2(\theta)} \\ &= \frac{\cos^2(\theta) + \sin^2(\theta)}{\cos^2(\theta)} \\ &= \frac{1}{\cos^2(\theta)} \\ &= \sec^2(\theta) \\ &= RHS \end{aligned}$$