

The Weekly Rigor

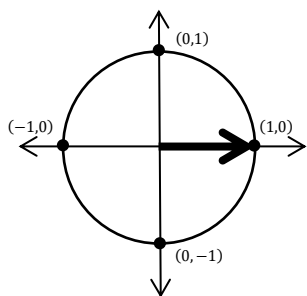
No. 260

“A mathematician is a machine for turning coffee into theorems.”

June 15, 2019

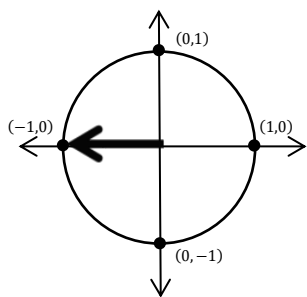
16 Problems Concerning the Unit Circle (Part 1 of 2) (Part 3)

9. $\sec(0) = \frac{1}{\cos(0)} = \frac{1}{1} = 1.$



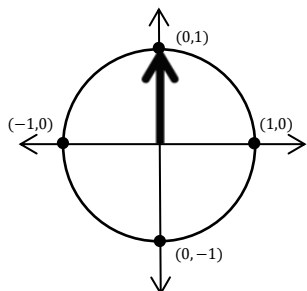
For any angle θ in standard position and its corresponding point (x, y) on the unit circle, $(\cos(\theta), \sin(\theta)) = (x, y)$. Hence, for $\theta = 0$, $\cos(0) = 1$.

10. $\sec(\pi) = \frac{1}{\cos(\pi)} = \frac{1}{-1} = -1.$



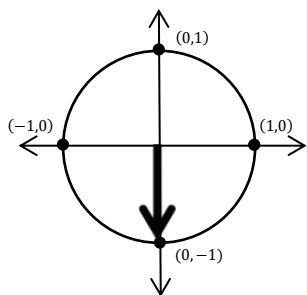
For any angle θ in standard position and its corresponding point (x, y) on the unit circle, $(\cos(\theta), \sin(\theta)) = (x, y)$. Hence, for $\theta = \pi$, $\cos(\pi) = -1$.

11. $\csc\left(\frac{\pi}{2}\right) = \frac{1}{\sin\left(\frac{\pi}{2}\right)} = \frac{1}{1} = 1.$



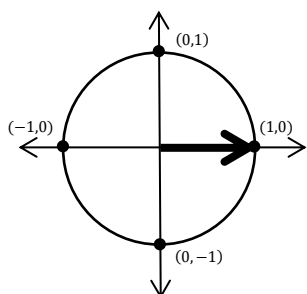
For any angle θ in standard position and its corresponding point (x, y) on the unit circle, $(\cos(\theta), \sin(\theta)) = (x, y)$. Hence, for $\theta = \frac{\pi}{2}$, $\sin\left(\frac{\pi}{2}\right) = 1$.

$$12. \csc\left(\frac{3\pi}{2}\right) = \frac{1}{\sin\left(\frac{3\pi}{2}\right)} = \frac{1}{-1} = -1.$$



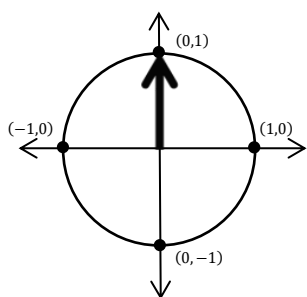
For any angle θ in standard position and its corresponding point (x, y) on the unit circle, $(\cos(\theta), \sin(\theta)) = (x, y)$. Hence, for $\theta = \pi$, $\sin\left(\frac{3\pi}{2}\right) = -1$.

$$13. \tan(0) = \frac{\sin(0)}{\cos(0)} = \frac{0}{1} = 0.$$



For any angle θ in standard position and its corresponding point (x, y) on the unit circle, $(\cos(\theta), \sin(\theta)) = (x, y)$. Hence, for $\theta = 0$, $\sin(0) = 0$ and $\cos(0) = 1$.

$$15. \cot\left(\frac{\pi}{2}\right) = \frac{\cos\left(\frac{\pi}{2}\right)}{\sin\left(\frac{\pi}{2}\right)} = \frac{0}{1} = 0.$$



For any angle θ in standard position and its corresponding point (x, y) on the unit circle, $(\cos(\theta), \sin(\theta)) = (x, y)$. Hence, for $\theta = \frac{\pi}{2}$, $\cos\left(\frac{\pi}{2}\right) = 0$ and $\sin\left(\frac{\pi}{2}\right) = 1$.

“Only he who never plays, never loses.”