

Exercise 178

A particle travels in a circular path at a **constant angular speed** ω . The angular speed is modeled by the function $\omega = 9|\cos(\pi t - \pi/12)|$. Determine the angular speed at $t = 9$ sec.

[**TYPO: ω is not constant, though; the given function models it.**]

Solution

Plug $t = 9$ into the given function.

$$\omega(t) = 9 \left| \cos \left(\pi t - \frac{\pi}{12} \right) \right| \Rightarrow \omega(9) = 9 \left| \cos \left(\pi \times 9 - \frac{\pi}{12} \right) \right| = \frac{9(1 + \sqrt{3})}{2\sqrt{2}} \approx 8.69 \frac{\text{rad}}{\text{s}}$$

Below is a plot of ω versus t .

