Answer on Question #63811-Physics-Mechanics

The average day on Jupiter is 10 hours. If the average angular acceleration is -5 x 10(to the negative 10 power) radians per second squared, how many earth days does it take for Jupiter to stop rotating?

Solution

$$\omega = \frac{2\pi}{T}.$$

$$\omega - \alpha t = 0$$

$$t = \frac{\omega}{\alpha} = \frac{2\pi}{T\alpha} = \frac{2\pi}{(10 \cdot 3600)(5 \cdot 10^{-10})} = 349066\, s = \frac{349066}{(24 \cdot 3600)}\, days = 4\, days.$$

Answer: 4 days.