

Custom Problem #2: Power Dissipation

In the forced oscillator, show that the energy dissipated per cycle by the frictional force $r\dot{x}$ for an angular frequency ω is given by $\pi r \omega x_{\max}^2$, where x_{\max} is the maximum displacement of the oscillator during the cycle. From this result show that the average power dissipated by the frictional force is equal to the average power supplied by the driving force that was derived in lecture.