

Name: _____

Date: _____

MCHS Honors Physics 2014-2015

Power 1

Work = Force x Distance $\rightarrow W = F \cdot d$ or $W = F \cdot d \cdot \cos \theta$

Power = Work \div Time Interval $\rightarrow P = \frac{W}{\Delta t}$

The SI unit for Power is the Watt, which is also known as Joules/Second

It can be re-written using the definition of Work, $W = F \cdot d$, so $P = F \frac{d}{\Delta t}$

Since the distance an object moves per unit time is also known as velocity, we can re-write this equation as: $P = Fv$

1. A 1.0×10^3 kg elevator carries a maximum load of 800.0 kg. A constant frictional force of 4.0×10^3 N slows the elevators motion. What minimum power, in kilowatts, must the elevator produce to lift the fully loaded elevator at a constant speed of 3.00 m/s?
2. A car with a mass of 1.5×10^3 kg starts from rest and accelerates to a speed of 18.0 m/s in 12 seconds. Assume that the force of resistance remains constant at 400.0 N during this time. What is the average power developed by the car's engine?
3. How long does it take a 19 kW steam engine to do 6.8×10^7 Joules of work?