

#23 SECTION 14.1 NOTES

WORK - WHEN FORCE IS APPLIED TO AN OBJECT; IT MOVES
(IN DIRECTION OF FORCE)

- WORK = FORCE * DISTANCE \Rightarrow MEASURED IN N*m OR JOULES (J)

$$W = F * d \quad F = \frac{W}{d} \quad d = \frac{W}{F}$$

EXAMPLE 1: I PUSH A DESK w/ A FORCE OF 200 N A DISTANCE OF 5 m. HOW MUCH WORK WAS DONE?

$$W = F * d \Rightarrow 200 \text{ N} * 5 \text{ m} = \boxed{1000 \text{ J}}$$

POWER - THE RATE AT DOING WORK

POWER = $\frac{\text{WORK}}{\text{TIME}}$ \Rightarrow MEASURED IN $\frac{\text{J}}{\text{s}}$ OR WATTS (W)

$$P = \frac{W}{t} \quad W = Pt \quad t = \frac{W}{P}$$

EXAMPLE 2: WHAT IS THE POWER INVOLVED IF I PUSH THAT DESK FOR 4 SECS?

$$P = \frac{W}{t} = \frac{1000 \text{ J}}{4 \text{ s}} = \boxed{250 \text{ W}}$$

MOMENTUM - PRODUCTS OF AN OBJECTS MASS + VELOCITY

MOMENTUM = MASS * VELOCITY \Rightarrow MEASURED IN $\frac{\text{kg} \cdot \text{m}}{\text{s}}$

$$\text{MOM.} = m \cdot v \quad m = \frac{\text{MOM.}}{v} \quad v = \frac{\text{MOM.}}{m.}$$

EXAMPLE 3: WHAT IS MY MOMENTUM AS I ~~RUN~~ RUN DOWN THE HALL AT A VELOCITY OF 5 m/s?

$$\text{MOM.} = m \cdot v \\ 75 \text{ kg} * 5 \text{ m/s} = \boxed{750 \frac{\text{kg} \cdot \text{m}}{\text{s}}}$$