

NOTES ON KINETIC ENERGY AND WORK-ENERGY THEOREM

$$\boxed{K = \frac{1}{2}mv^2} \text{ Kinetic Energy}$$

$$\boxed{W_{net} = K_f - K_i = \Delta K} \text{ Work-Energy Theorem}$$

- a) Kinetic energy is energy associated with the motion of a particle.
- b) The SI unit of KE is the joule (J).
- c) The Work-Energy Theorem is valid even when the net force is not constant!
- d) The Work-Energy Theorem is valid only for particle-like objects.
- e) If work is done on a system and the **only** change in the system is in its speed, the work done by the net force equals the change in KE of the system!
- f) Work and Energy are equivalent concepts:

$$Work \rightleftharpoons Energy$$

- g) Work is a method of transferring energy to or from a system due to a force acting on the system.
- h) If $W_{net} > 0$, then $\Delta K > 0$ and the speed of the particle has increased. Energy had been transferred **into** system.
- i) If $W_{net} < 0$, then $\Delta K < 0$ and the speed of the particle has decreased. Energy had been transferred **out** of system.