

Work Energy Theorm #3
 Prove the Work Energy Theorm (WFn = Change in KE)
 Start with $F = ma$

Method A

$F_n = ma$
 $\frac{F_n}{1} = m \left(\frac{v_f^2 - v_i^2}{2d} \right)$
 $W_{fn} = Fd = \frac{mv_f^2 - mv_i^2}{2} = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$

$W_{fn} = Fd = \Delta KE$

Method B

Start with $W = Fd$
 $W = mad$

$W = m \left(\frac{v_f - v_i}{t} \right) d$
 $W = m \left(\frac{v_f - v_i}{t} \right) \left(\frac{v_i + v_f}{2} \right) t$
 $W = \frac{m}{2} (v_f - v_i)(v_i + v_f)$
 $W = \frac{m}{2} (v_i v_f + v_f^2 - v_i^2 - v_i v_f)$
 $W = \frac{1}{2}m (v_f^2 - v_i^2)$
 $W = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$
 $W = KE_f - KE_i = \Delta KE$

Handwritten notes:
 $KE_f - KE_i = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$
 $W_{fn} = F_n d = \Delta KE$
 $a = \frac{v_f^2 - v_i^2}{2d}$
 $a = \frac{v_f - v_i}{t}$
 $d = \frac{(v_i + v_f)t}{2}$
FOIL

Dec 5-8:36 AM