

Physics 250 Test 3 Equation Sheet

Velocity and acceleration: $v_{av} = \frac{\Delta x}{\Delta t}$ $a_{av} = \frac{\Delta v}{\Delta t}$

Constant velocity: $x_B = x_A + v_{AB}\Delta t_{AB}$

Constant acceleration: $v_B = v_A + a_{AB}\Delta t_{AB}$

$$x_B = x_A + v_A\Delta t_{AB} + \frac{a_{AB}}{2}\Delta t_{AB}^2$$

$$v_B^2 = v_A^2 + 2a_{AB}\Delta x_{AB}$$

$$x_B = x_A + \left(\frac{v_A + v_B}{2}\right)\Delta t_{AB}$$

Circular motion: $a_{rad} = v^2/r$ $F_{rad} = mv^2/r$

Forces: $\vec{a} = \vec{F}_{net}/m$ $w = mg$ $f_s \leq \mu_s n$ $f_k = \mu_k n$ $f_r = \mu_r n$

$$f_{spring} = -kx$$

Energy: $W_{net} = \int \vec{F}_{net} \cdot d\vec{s}$ $W_{net} = \Delta K$ $E_f = E_i + W_{other}$

$$\Delta U = -W_{cons} \quad K = \frac{1}{2}mv^2 \quad U_g = mgh \quad U_s = \frac{1}{2}kx^2$$

$$P = \frac{dW}{dt} = \vec{F} \cdot \vec{v}$$

Momentum: $\vec{p} = m\vec{v}$ $\vec{J} = \vec{F}\Delta t$ $\vec{J} = \Delta\vec{p}$

Constants: $g = 9.80 \text{ m/s}^2$