

AP Physics 1
Fall Final Exam Formulas

1.) 1-D Motion

$$v_{av} = \frac{\Delta x}{\Delta t} \quad a_{av} = \frac{\Delta v}{\Delta t} \quad s = \frac{d}{\Delta t} \quad \Delta x = x - x_i$$

$$\Delta x = \frac{1}{2}at^2 + v_i t \quad \Delta x = \left(\frac{v + v_i}{2} \right) t \quad v = at + v_i \quad v^2 = v_i^2 + 2a\Delta x$$

2.) 2-D Motion Vectors

$$\Delta y = y - y_i = -\frac{1}{2}gt^2 + v_{yi}t \quad \Delta x = x - x_i = v_{xi}t \quad v_y = -gt + v_{yi} \quad v_y^2 = v_{yi}^2 - 2g\Delta y \quad \Delta y = \left(\frac{v + v_i}{2} \right) t$$

$$v_x = v \cos \theta \quad v_y = v \sin \theta \quad v = \sqrt{v_x^2 + v_y^2} \quad \theta = \tan^{-1} \left(\frac{v_y}{v_x} \right) \quad \vec{v}_A = \vec{v}_C + \vec{v}_W$$

3.) Forces and Newton's Laws

$$\sum \vec{F} = m\vec{a} \quad F_f = \mu F_N \quad F_g = mg \quad F_x = F \cos \theta \quad F_y = F \sin \theta$$

$$F_{||} = F_g \sin \theta \quad F_{\perp} = F_g \cos \theta$$

5.) Circular Motion

$$a_c = \frac{v^2}{r}$$