

PHYS 124, LEC 01 : Particles and Waves (Marc de Montigny, Instructor)
Formula Sheet : Mid-Term Exam, October 25th 2006

Name : _____
 Student ID: _____

Feel free to add your own formulas on this side only. You will lose 5 marks (out of 20) if:

1. full solutions are included;
2. this sheet is not returned with your exam, or
3. you have written formulas on both sides (use this side only).

$$\cos \theta = \frac{x}{h} \quad \sin \theta = \frac{y}{h} \quad \tan \theta = \frac{y}{x} \quad h^2 = x^2 + y^2$$

$$ax^2 + bx + c = 0 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \vec{v}_{13} = \vec{v}_{12} + \vec{v}_{23}$$

$$\Delta x = x_f - x_i \quad v_{av} = \frac{\Delta x}{\Delta t} \quad v = \lim_{\Delta t \rightarrow 0} \frac{\Delta x}{\Delta t} \quad a = \lim_{\Delta t \rightarrow 0} \frac{\Delta v}{\Delta t}$$

$$v_x = v_{0x} + a_x t$$

$$v_y = v_{0y} + a_y t$$

$$x = x_0 + v_{0x} t + \frac{1}{2} a_x t^2$$

$$y = y_0 + v_{0y} t + \frac{1}{2} a_y t^2$$

$$x = x_0 + \frac{1}{2} (v_{0x} + v_x) t$$

$$y = y_0 + \frac{1}{2} (v_{0y} + v_y) t$$

$$v_x^2 = v_{0x}^2 + 2a_x(x - x_0)$$

$$v_y^2 = v_{0y}^2 + 2a_y(y - y_0)$$

$$\sum \vec{F} = m\vec{a} \quad \sum F_x = ma_x \quad \sum F_y = ma_y \quad \vec{F}_{AB} = -\vec{F}_{BA}$$

$$\vec{W} = m\vec{g} \quad \vec{a}_{\text{grav}} = (a_x, a_y) = (0, -g) \quad g = 9.81 \text{ m/s}^2$$

$$F_x = -kx \quad f_k = \mu_k N \quad f_s \leq f_{s,\text{max}} = \mu_s N \quad a_{\text{cp}} = \frac{v^2}{r} \quad v = \frac{2\pi r}{T}$$

$$W = Fd \cos \theta \quad K = \frac{1}{2} mv^2 \quad W_{\text{total}} = \Delta K = K_f - K_i \quad P = \frac{W}{t} = Fv$$

$$\Delta U = U_f - U_i = -W_c \quad U = mgy \quad U = \frac{1}{2} kx^2$$

$$E = K + U \quad E_f = E_i + W_{\text{nc}}$$