Physics 2010
Fall Semester 2008
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COVER SHEET - EXAM 2

Data:

$g = 9.80\ m/s^2$

$G = 6.67 \times 10^{-11}\ N \cdot m^2/kg^2$

Equations:

x-equations

$$x = x_o + \left(\frac{v_x + v_{ox}}{2}\right)t$$

$$v_x = v_{ox} + a_x t$$

$$x = x_o + v_{ox}t + \frac{1}{2}a_x t^2$$

$$v_x^2 = v_{ox}^2 + 2a_x(x - x_o)$$

y-equations

$$y = y_o + \left(\frac{v_y + v_{oy}}{2}\right)t$$

$$v_y = v_{oy} + a_y t$$

$$y = y_o + v_{oy}t + \frac{1}{2}a_y t^2$$

$$v_y^2 = v_{oy}^2 + 2a_y(y - y_o)$$

$$\vec{F}_{NET} = \sum F_{EXT} = m\vec{a}$$

1. $F_{NET_x} = ma_x = \sum F_x$
2. $F_{NET_y} = ma_y = \sum F_y$

Friction

(a) Static (f_s) $f_s \le f_s^{max} = \mu_s F_N$

(b) Kinetic (f_k) $f_k = \mu_k F_N$

Universal Gravitation

$$F_G = G\frac{m_1 m_2}{r^2}$$

$$W = mg$$

$$g = G\frac{M_{planet}}{R_{planet}^2}$$

$$\vec{F}_c = m\vec{a}_c$$

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

$$v = \frac{2\pi r}{T}$$

$$\Delta\vec{r} = (\Delta x)\hat{i} + (\Delta y)\hat{j}$$

$$\vec{r} = x\hat{i} + y\hat{j}$$

$$r = \sqrt{x^2 + y^2}$$

$$\theta = \tan^{-1}\frac{y}{x}$$

$$\vec{v} = \lim_{\Delta t \to o}\frac{\Delta\vec{r}}{\Delta t}$$

Given: $\vec{r}_o = x_o\hat{i} + y_o\hat{j}$

$\vec{v}_o = v_{ox}\hat{i} + v_{oy}\hat{j}$