PHYSICS 201 TEST 3 EQUATIONS

Kinematics (Our Old Friends)

Variables					
Equation	x	a	v	v_o	t
$v = v_o + at$	-	+	+	+	+
$x = \frac{1}{2}(v_o + v)t$	+	-	+	+	+
$x = v_o t + \frac{1}{2}at^2$	+	+	-	+	+
$v^2 = v_o^2 + 2ax$	+	+	+	+	-

Energy and Work and Power

$$K = \tfrac{1}{2}mv^2 \qquad W = Fd \cos\phi \qquad P_{avg} = \frac{W}{\Delta t}$$

$$\Delta E_{mec} = \Delta K + \Delta U$$

No friction:

$$W = \Delta K + \Delta U.$$

$$P_{avg} = \frac{\Delta E}{\Delta t}.$$

Friction:

$$W = \Delta E_{mec} + \Delta E_{th}$$

$$P_{avg} = Fv \cos\phi.$$

Hooke's Law (Springs)

$$F_x = -kx \qquad W_s = \tfrac{1}{2}kx_i^2 - \tfrac{1}{2}kx_f^2 \qquad U(x) = \tfrac{1}{2}kx^2$$

Center of Mass

$$x_{com} = \frac{m_1 x_1 + m_2 x_2}{m_1 + m_2}.$$

$$\vec{v}_{com} = \frac{\vec{P}}{m_1 + m_2} = \frac{\vec{p}_{1i} + \vec{p}_{2i}}{m_1 + m_2}.$$

Momentum and Impulse

$$\vec{p} = m\vec{v}$$

$$\Delta\vec{p} = \vec{J}$$

$$J = F_{avg}\,\Delta t.$$

$$\vec{P} = \text{constant} \quad \text{(closed, isolated system)}$$

Constants

$$g = 9.81 \text{ m/s}^2$$