

Physics 102 Major1
Formula sheet
Spring Semester 2003-2004 (Term 032)

$$v = \lambda f = \frac{\omega}{k}$$

$$v = \sqrt{\frac{\tau}{\mu}} \quad v = \sqrt{\frac{B}{\rho}}$$

$$y = y_m \sin(kx - \omega t + \phi)$$

$$P = \frac{1}{2} \mu \omega^2 y_m^2 v$$

$$S = S_m \cos(kx - \omega t)$$

$$\Delta P = \Delta P_m \sin(kx - \omega t), \Delta P_m = \rho v \omega S_m$$

$$I = \frac{1}{2} \rho (\omega S_m)^2 v$$

$$\beta = 10 \log \left(\frac{I}{I_0} \right)$$

$$I = \frac{\text{Power}}{\text{Area}}$$

$$f' = f \left(\frac{v \pm v_D}{v \mp v_s} \right)$$

$$y = \left(2y_m \cos \frac{\phi}{2} \right) \sin \left(kx - \omega t + \frac{\phi}{2} \right)$$

$$y = (2y_m \sin kx) \cos \omega t$$

$$f_n = \frac{nv}{2L}, \quad n = 1, 2, 3, \dots$$

$$f_n = \frac{nv}{4L}, \quad n = 1, 3, 5, \dots$$

$$\Delta L = \alpha L \Delta T$$

$$PV = nRT = NkT$$

$$\Delta L = \frac{\lambda}{2\pi} \phi$$

$$\Delta L = m\lambda \quad m = 0, 1, 2, \dots$$

$$\Delta L = \left(m + \frac{1}{2} \right) \lambda, \quad m = 0, 1, 2, \dots$$

$$PV^\gamma = \text{constant}; \quad TV^{\gamma-1} = \text{constant}$$

$$C_v = \frac{3}{2} R \quad \text{for monatomic gases,}$$

$$= \frac{5}{2} R \quad \text{for diatomic gases.}$$

$$T_F = \frac{9}{5} T_C + 32$$

$$Q = mL$$

$$Q = mc\Delta T$$

$$Q = nc\Delta T$$

$$\Delta E_{\text{int}} = Q - W$$

$$\Delta E_{\text{int}} = nC_v \Delta T$$

$$C_p - C_v = R$$

$$W = \int PdV$$

$$H = \frac{Q}{t} = \kappa A \frac{T_H - T_C}{L}$$

$$P = \sigma \epsilon AT^4$$

$$\frac{mv^2}{2} = (3/2)kT$$

$$v_{\text{rms}} = \sqrt{\frac{3RT}{M}}$$

Constants:

$$\text{Pi} = \pi, \quad \text{lambda} = \lambda$$

$$1 \text{ Liter} = 10^{-3} \text{ m}^3$$

$$R = 8.31 \text{ J/mol K}$$

$$N_A = 6.02 \times 10^{23} \text{ molecules/mole}$$

$$1 \text{ atm} = 1.01 \times 10^5 \text{ N/m}^2$$

$$k = 1.38 \times 10^{-23} \text{ J/K}$$

$$I_0 = 10^{-12} \text{ W/m}^2$$

$$1 \text{ calorie} = 4.186 \text{ Joule}$$

$$\sigma = 5.67 \times 10^{-8} \text{ W / (m}^2 \text{ K}^4)$$

$$\text{micro} = 10^{-6}$$

$$\text{for water: } L_f = 80 \text{ cal/g}$$

$$L_v = 540 \text{ cal/g}$$

$$c = 1 \text{ cal/g.K}$$

$$a * b ** c = a b^c$$

