

Physics 471 Exam 2

$$r_s = \frac{\sin \theta_i \cos \theta_i - \sin \theta_t \cos \theta_t}{\sin \theta_i \cos \theta_i + \sin \theta_t \cos \theta_t} = -\frac{\sin(\theta_i - \theta_t)}{\sin(\theta_i + \theta_t)} = \frac{n_i \cos \theta_i - n_t \cos \theta_t}{n_i \cos \theta_i + n_t \cos \theta_t}$$

$$t_s = \frac{2 \sin \theta_i \cos \theta_i}{\sin \theta_i \cos \theta_i + \sin \theta_t \cos \theta_t} = \frac{2 \sin \theta_i \cos \theta_i}{\sin(\theta_i + \theta_t)} = \frac{2 n_i \cos \theta_i}{n_i \cos \theta_i + n_t \cos \theta_t}$$

$$r_p = \frac{\cos \theta_i \sin \theta_i - \cos \theta_t \sin \theta_t}{\cos \theta_i \sin \theta_i + \cos \theta_t \sin \theta_t} = \frac{\tan(\theta_i - \theta_t)}{\tan(\theta_i + \theta_t)} = \frac{n_t \cos \theta_i - n_i \cos \theta_t}{n_i \cos \theta_i + n_t \cos \theta_t}$$

$$t_p = \frac{2 \cos \theta_i \sin \theta_i}{\cos \theta_i \sin \theta_i + \cos \theta_t \sin \theta_t} = \frac{2 \cos \theta_i \sin \theta_i}{\sin(\theta_i + \theta_t) \cos(\theta_i - \theta_t)} = \frac{2 n_i \cos \theta_i}{n_i \cos \theta_i + n_t \cos \theta_t}$$

$$T = \frac{n_t \cos \theta_t}{n_i \cos \theta_i} |t|^2$$

$$R.A. = 2 \tan \theta_{\max} = \frac{D}{f}$$

$$\frac{n_1}{s_o} + \frac{n_2}{s_i} = \frac{n_2 - n_1}{R}$$

$$\frac{1}{f} = (n_t - 1) \left(\frac{1}{R_1} + \frac{1}{R_2} \right)$$

$$M_L = -M_t^2$$

$$\epsilon_o = 8.854 \times 10^{-12} \text{ C}^2/\text{N} \cdot \text{m}^2$$

$$\mu_o = 4\pi \times 10^{-7} \text{ T} \cdot \text{m}/\text{A}$$

$$c = 2.9979 \times 10^8 \text{ m/s}$$

$$q_e = 1.602 \times 10^{-19} \text{ C}$$

$$m_e = 9.108 \times 10^{-31} \text{ kg}$$

$$k_B = 1.380 \times 10^{-23} \text{ J/K}$$

$$h = 6.626 \times 10^{-34} \text{ J} \cdot \text{s}$$

$$\hbar = h/2\pi = 1.054 \times 10^{-34} \text{ J} \cdot \text{s}$$

$$\sigma = 5.670 \times 10^{-8} \text{ W/m}^2 \cdot \text{K}^4$$