

$Av = 17.4$



THIRD MIDTERM

Name (print)

KASTRO

Name (sign)

Discussion Instructor (circle one): DeTienne Hamed Molina Paul Smith Zhang

Discussion Section # _____

REPORT ALL NUMBERS TO THREE SIGNIFICANT FIGURES!

Use the conversion constants and data given on the front page.

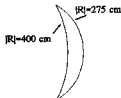
- (a) What is the maximum order that can be observed with a grating with 1550 lines/cm, using light with wavelength 475 nm.

13 (integer)

- (b) Calculate the polarizing angle for light of wavelength 650 nm for light in water ($n = 1.33$) incident on a diamond ($n = 2.40$).

61.0°

- (c) Calculate the focal length in water ($n = 1.33$) for the glass ($n = 1.55$) lens shown. You supply the signs for R .

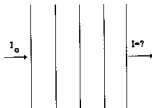


53.2 m

- (d) Calculate the thickness of a quarter-wave plate for a material where $n_e = 1.4700$ and $n_o = 1.4750$ for $\lambda = 590$ nm.

$2.95 \times 10^{-5} \text{ m}$

- (e) Five polarizers are arranged in a row. Completely unpolarized light is incident on the first. The angles between their axes are 10° each. What is the intensity of the emerging light as a fraction of I_0 ?



$I = 0.442 I_0$