PHYS 2303 Homework 8

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Chapter 3 Problem 33

If 500-nm and 650-nm light illuminates two slits that are separated by 0.50 mm, how far apart are the second-order maxima for these two wavelengths on a screen 2.0 m away?

Chapter 3 Problem 38

What is the angular width of the central fringe of the interference pattern of

(a) 20 slits separated by $d = 2.0 \times 10^{-3}$ mm?

(b) 50 slits with the same separation? Assume $\lambda = 600$ nm.

Chapter 3 Problem 71

After a minor oil spill, a think film of oil ($n = 1.40$) of thickness 450 nm floats on the water surface in a bay.

(a) What predominant color is seen by a bird flying overhead?

(b) What predominant color is seen by a seal swimming underwater?

Problem 4

Using Euler's formula...

(a) show $(\cos(\theta) + i\sin(\theta))^n = \cos(n\theta) + i\sin(n\theta)$

(b) express $\sqrt{i}$ in terms of real part + imaginary part.