CENGAGE | WEBASSIGN

yathartha.regmi@ttu.edu

(Sign out)

Home   My Assignments

Grades   Communication

Calendar

    My eBooks

← **PHYS 2401, section 201, Summer 2 2022**

Ray Optics (Homework)

🎓 **INSTRUCTOR**

Keith West

Texas Tech University

Current Score

QUESTION	1	2	3	4	5	6
POINTS	–/3	–/2	–/2	–/1	–/1	–/1

TOTAL SCORE	
–/10	0.0%

Due Date

THU, AUG 4, 2022

11:58 PM CDT

📅 Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

----

1. **[–/3 Points]** | DETAILS | **SERPSE10 34.4.OP.003.**

| MY NOTES | | ASK YOUR TEACHER | | PRACTICE ANOTHER |

The wavelength of red helium–neon laser light in air is 632.8 nm.

(a) What is its frequency?

[   ] Hz

(b) What is its wavelength in glass that has an index of refraction of 1.53?

[   ] nm

(c) What is its speed in the glass?

[   ] Mm/s

Need Help? [Read It] [Watch It]
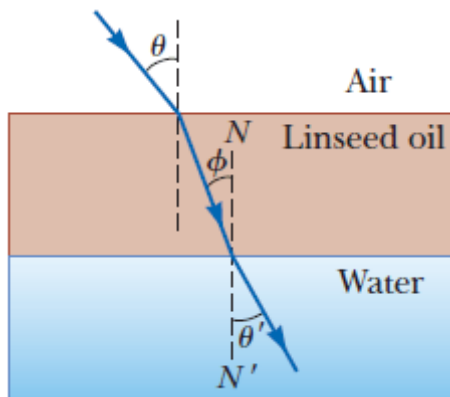
---

2. **[–/2 Points]**   DETAILS   **SERPSE10 34.4.OP.006.MI.**

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

The figure shows a refracted light beam in linseed oil making an angle of φ = 27.6° with the normal line
NN'. The index of refraction of linseed oil is 1.48.

(a) Determine the angle θ.

(b) Determine the angle θ'.

Need Help?   Read It   Master It

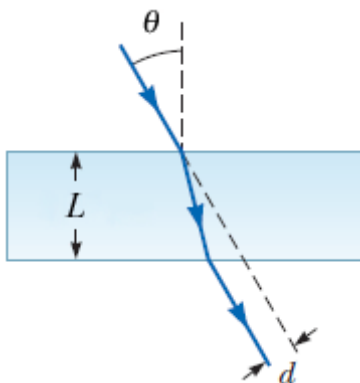**3.** **[–/2 Points]**   DETAILS   **SERPSE10 34.4.OP.009.**

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

When the light ray illustrated in the figure below passes through the glass block of index of refraction n = 1.50, it is shifted laterally by the distance d. (Let L = 2.20 cm and θ = 32.0°.)

(a) Find the value of d.

[_____] cm

(b) Find the time interval required for the light to pass through the glass block.

[_____] ps

Need Help? [Read It] [Watch It]

---

4. [–/1 Points]   DETAILS   SERPSE10 34.4.OP.013.MI.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

(a) An opaque cylindrical tank with an open top has a diameter of 3.05 m and is completely filled with water. When the afternoon sun reaches an angle of 32.5° above the horizon, sunlight ceases to illuminate any part of the bottom of the tank. How deep is the tank (in m)?

[   ] m

(b) **What If?** On winter solstice in Honolulu, the sun reaches a maximum altitude of 45.3° above the horizon. What would the depth of the tank have to be (in m) for the sun not to illuminate the bottom of the tank on that day?

[   ] m

Need Help? [Read It] [Master It]

---

5. [–/1 Points]   DETAILS   SERPSE10 34.6.P.024.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

A light beam containing red and violet wavelengths is incident on a slab of quartz at an angle of incidence of 53.7°. The index of refraction of quartz is 1.455 at 600 nm (red light), and its index of refraction is 1.468 at 410 nm (violet light). Find the dispersion of the slab, which is defined as the difference in the angles of refraction for the two wavelengths.

[   ] °

Need Help? [Read It]
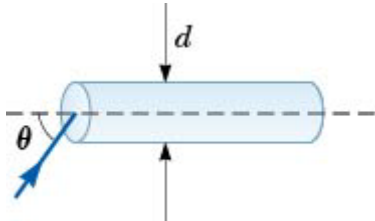
---

6. **[–/1 Points]**   DETAILS   **SERPSE10 34.7.OP.020.CTX.**

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

You are working in an optical research laboratory. One of the pieces of experimental apparatus involves a beam of light entering a transparent rod (see the figure below) of diameter d = 6.00 μm and index of refraction n = 1.26, surrounded by air.

Your supervisor has given you the task of determining the *cone of acceptance* for the rod, which is the maximum angle θ_{max} (in degrees) for which the light rays incident on the end of the rod are subject to total internal reflection along the walls of the rod.

[   ] °

Need Help?   Read It

Submit Assignment   Save Assignment Progress

Home   My Assignments   ⊞ Request Extension

TERMS OF USE   **PRIVACY**

TERMS OF USE   **PRIVACY**