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← **PHYS 1260, section 001, Fall 2020**

INSTRUCTOR

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## Exam 3 (1260) (Test)

| Current Score                                                                                           |  | Due Date                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>QUESTION</div> <div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div></div> |  | <div>THU, OCT 29, 2020</div> <div>1:15 PM EDT</div> <div><div><div><div></div><div>+</div></div></div>Request Extension</div>                                                                                                                                                                                                                           |
| <div><div><div>i</div></div> Description</div> <div></div>                                              |  | <div>Assignment Submission &amp; Scoring</div> <div>Assignment Submission</div> <div>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.</div> <div>Assignment Scoring</div> <div>Your last submission is used for your score.</div> |

1.

DETAILS

COLFUNPHYS1 23.P.003.

MY NOTES

ASK YOUR TEACHER

FM radio station KRTH in Los Angeles broadcasts on an assigned frequency of 101 MHz with a power of 50,000 W.

(a) What is the wavelength of the radio waves produced by this station?

(b) Estimate the average intensity of the wave at a distance of 53.8 km from the radio transmitting antenna. Assume for the purpose of this estimate that the antenna radiates equally in all directions, so that the intensity is constant over a hemisphere centered on the antenna.

(c) Estimate the amplitude of the electric field at this distance.

2.

DETAILS

COLFUNPHYS1 23.P.009.

MY NOTES

ASK YOUR TEACHER

Long-distance telephone communication utilizes transmission of electromagnetic signals in the microwave part of the spectrum. How long does it take to transmit a signal cross country, a distance of 5894 km?

3.

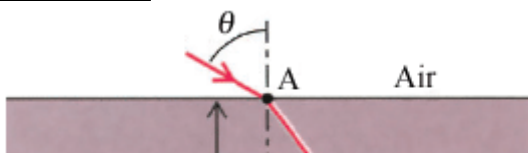
DETAILS

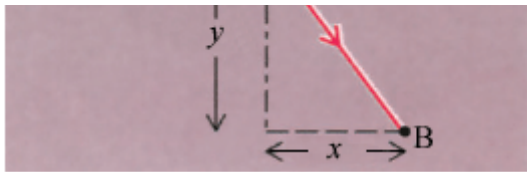
COLFUNPHYS1 23.P.029.

MY NOTES

ASK YOUR TEACHER

Light passes from air into another medium at point A (see figure below). How long does it take the light ray to travel from A to B? (Take  $\theta = 58.2^\circ$ ,  $x = 2.97$  m, and  $y = 4.12$  m.)





4. **DETAILS** COLFUNPHYS1 24.P.032.

MY NOTES

ASK YOUR TEACHER

Find the image distance and linear magnification for a small object on the optical axis,  $20.1$  cm from a lens of focal length  $-10$  cm.

image distance

linear magnification

5. **DETAILS** COLFUNPHYS1 24.P.033.

MY NOTES

ASK YOUR TEACHER

Find the focal length of a lens that produces an inverted image  $\text{six}$  times the size of a small object placed on the optical axis,  $32.1$  cm from the lens.

6. **DETAILS** COLFUNPHYS1 25.P.025.

MY NOTES

ASK YOUR TEACHER

A 60-year-old man, who has normal vision, has a near point of  $87$  cm. Instead of using reading glasses, he chooses to use a magnifier of focal length  $29$  cm for reading. He reads with his eyes relaxed.

(a) Find the magnification  $M$ .

(b) What is the distance from the page to the magnifier?

(c) What is the maximum angular magnification that can be obtained with this magnifier by a child with a near point of  $15$  cm?

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