

LIGHT AND OPTICS

Chapter 22-24 Assignments and Answers

ASSIGNMENTS:

Ch. 22 Start-Up Assignment: Quiz date: _____

Read and take notes on Sec. 22.1-22.2 (no math in either), 22.3-22.4, 22.7

Work textbook pg. 629-630 Problems #5-9, 11, 16

Ch. 23 Problem Assignment #1: HW due: _____

Pg. 658-660 Problems #1, 3, 7-13a, 15-16, 17a, 21

Ch. 23 Problem Assignment #2: HW due: _____

Pg. 659-663 Problems #23-24, 26-28, 30, 36-37, 43, 45, 47, 49, 53, 56

Ch. 24 Problem Assignment: HW due: _____

Pg. 692-693 Problems #1-5, 8, 11, 12, 17-22, 27-32, 36, 39, 41-45

ANSWERS:

Ch. 22 Start-Up:

5. $1.88E^{10}$ Hz

6. 0.01 m

7. $3.1E^{-7}$ m, UV wave

8. $4.6E^{14}$ Hz, Visible light (orange-ish)

9. 8.33min

11. $4.0E^{16}$ m

16. radio hears 0.14s sooner

Ch. 23 Problems #1:

1. 5.0m

3. 5°

7. 36.0cm

8. 11.5cm

9. -2.093cm, virtual & upright

10. 4.2m

11. 5.66cm, concave

12. -19.7m, convex

13.a. Ray diagram, and $s_i = 7$ cm.

15.a. At center of curvature.

b. Real

c. inverted

d. -1

16. -36cm, convex

17.a. 2 Ray diagrams

21.a. Convex

b. -21.8cm

c. -98.5cm

d. -196.9cm

Ch. 23 Problems #2:

- 23.a. $1.97E^8$ m/s
b. $1.99E^8$ m/s
c. $2.21E^8$ m/s
24. 1.31
26. 34.3°
27. 63.97°
28. 43.4°
- 30.a. 26.93° b. 31.17° c. 31.17°
36. 61.74° , must start in Lucite
37. 1.35
- 43.a. Ray diagram.
b. 39cm
45. 41.1cm, converging, real image
- 47.a. 72cm in front of lens
b. +4.0
- 49.a. 8.1cm
b. 8.2cm
c. 8.7cm
d. 24cm
- 53.a. 75mm
b. 25mm
56. 367.5cm

Ch. 24 Problems:

1. 490nm
2. $5.92E^{-6}$ m
3. 624nm, $4.81E^{14}$ Hz
4. 3.94cm
5. $1.432E^{-4}$ m
8. 14.5° and/or 48.6°
11. 2.72mm
12. 2.41mm
17. 1.51°
18. 782nm
19. 2.51m
20. 4.5mm
21. $3.55E^{-6}$ m
22. 7.8cm
27. 4.43°
28. 447nm
29. 1635 lines/cm
30. 1 complete order ($m=1.72$)
31. $2.204E^{-6}$ m, 53.3°
32. 24.35°
36. 1.048m
39. 643nm
41. 169nm
42. 228nm
43. $8.53E^{-6}$ m
44. $9.045E^{-6}$ m
45. Bright: 112.5nm
Dark: 225nm