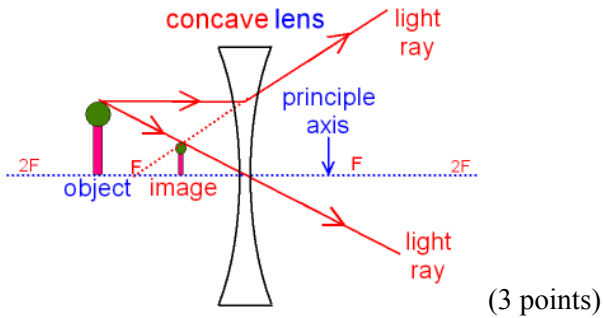


Optics Scrimmage Answer Key

48 points total



1. Virtual upright (2, one for each correct word)
2. Height of 3.2 cm, 22.5 cm from the lens (2 points, one for each correct calculation)
3. Specular (1)
5. Purple (1), tertiary (1)
6. Magenta (1)
7. 48.6° (1)
8. Lens temporarily reshapes cornea that helps light refract into the eye. The vision will reflect from the retina and allows her to see instead of focusing in front of the retina (1 point)
9. CDs have small pits in the plastic in a spiral, wound tightly enough to caught the light to diffract into a full visible spectrum (example of diffraction grating) (1 point)
10. Concave mirror anywhere except at the primary focal point (f) (1 point)
11. Convex between f and lens (1 point)
12. Reflective prisms have total internal reflection (TIR) for high reflectivity, sharper image, and erect image. (1) At least 5 of the prisms mentioned below must be in their answer to receive full credit - if not, no points. (1)
Porro prism
Porro–Abbe prism
Amici roof prism
Pentaprism and roof pentaprism
Abbe–Koenig prism
Schmidt–Pechan prism
Bauernfeind prism
Dove prism
Retroreflector prism
45-90-45 accepted
13. a) Chartreuse, tertiary (1 point total, 0.5 for each part)
b) 2.2×10^5 J (3 points - 1 point for the correct answer, 1 point for label of Joules, 1 point for work shown)
14. Radio, microwave, infrared, visible, ultraviolet, x-ray, gamma (all of no point; 1 point)
15. Red, green, blue (all or no point; 1 point)
16. Plateau prism: object beam has traveled a different path, recombining the beams and shows how the light rays in the object beam have been changed compared to the reference beam that catches light rays from every surrounding point? (3 points)

17. 299,792,458 m/s (2 points - one point for correct number, 1 point for m/s)
18. No light goes through (1 point)
19. The vision would be very blurry because the cornea does most of the refracting in the eye so it will not focus sharply of the retina (1 point)
20. Biconvex (1)
21. Planoconvex (1)
22. Positive meniscus (1)
23. Negative meniscus (1)
24. Planoconcave (1)
25. Biconcave (1)
26. Ora serrata (1)
27. Ciliary body (1)
28. Pupil (1)
29. Scleral venous sinus (1)
30. Posterior segment (1)
31. Macula lutea (1)
32. Fovea centralis (1)
33. Optic disc (blind spot) - 1 point for optic disc, only ½ point for blind spot
34. Denser medium to less dense medium (1 point)
35. 1:20 (1 point)