

1. A negative focal length corresponds to which one or more of the following?
 - a. Double-convex lens
 - b. Planoconcave lens
 - c. Convex mirror
 - d. Concave mirror
2. An object farther from a converging lens than its focal point always has an image that is
 - a. inverted.
 - b. virtual.
 - c. the same in size.
 - d. smaller in size.
3. An object closer to a converging lens than its focal point always has an image that is
 - a. inverted
 - b. virtual.
 - c. the same in size.
 - d. smaller in size.
4. When the distance of a real object from a converging lens equals the focal length of the lens,
 - a. the image is virtual, erect, and larger than the object.
 - b. the image is real, inverted, and larger than the object.
 - c. the image in real, inverted, and the same size as the object.
 - d. no image is formed.
5. Relative to its object, a real image formed by a lens is always
 - a. erect.
 - b. inverted.
 - c. smaller.
 - d. larger.
6. Relative to its object, a real image formed by a spherical mirror is always
 - a. erect.
 - b. inverted.
 - c. smaller.
 - d. larger.
7. The image of a real object produced by a diverging lens is never
 - a. real.
 - b. virtual.
 - c. erect.
 - d. smaller than the object.
8. A negative magnification corresponds to an image that is
 - a. erect.
 - b. inverted.
 - c. smaller than the object.
 - d. larger than the object.
9. A negative image distance signifies an image that is
 - a. real.
 - b. virtual.
 - c. erect.
 - d. inverted.
10. The lens of the eye forms an image on the retina that is
 - a. real and erect.
 - b. real and inverted.
 - c. virtual and erect.
 - d. virtual and inverted.
11. When a converging lens of focal length F is used as a magnifying glass, the object distance must be
 - a. less than F .
 - b. equal to F .
 - c. between F and $2F$.
 - d. more than $2F$.
12. A concave mirror produces an erect image when the object distance is
 - a. less than f .
 - b. equal to f .
 - c. between f and $2f$.
 - d. more than $2f$.
13. The image formed by a concave mirror is larger than the object
 - a. when d_o is less than $2f$.
 - b. when d_o is more than $2f$.
 - c. for no values of p .
 - d. for all values of p .
14. The image formed by a convex mirror is larger than the object
 - a. when d_o is less than $2f$.
 - b. when d_o is more than $2f$.
 - c. for no values of d_o .
 - d. for all values of d_o .
15. An object is located 10 cm from a converging lens of focal length 12 cm. The image distance is
 - a. +5.5 cm
 - b. -5.5 cm
 - c. +60 cm
 - d. -60 cm
16. An object is located 12 cm from a converging lens of focal length 10 cm. The image distance is
 - a. +5.5 cm
 - b. -5.5 cm
 - c. +60 cm
 - d. -60 cm
17. The image of an object 10 cm from a lens is located 10 cm behind the object. The focal length of the lens is
 - a. +6.7 cm
 - b. -6.7 cm
 - c. +20 cm
 - d. -20 cm
18. A pencil is 10 cm long is placed 70 cm in front of a lens of focal length +50 cm. The image is
 - a. 4 cm long and erect.
 - b. 4 cm long and inverted.
 - c. 25 cm long and erect.
 - d. 25 cm long and inverted.

19. A pencil is 10 cm long is placed 100 cm in front of a lens of focal length +50 cm. The image is
- 5 cm long and erect.
 - 5 cm long and inverted.
 - 10 cm long and erect.
 - 10 cm long and inverted.
20. A pencil is 10 cm long is placed 175 cm in front of a lens of focal length +50 cm. The image is
- 4 cm long and erect.
 - 4 cm long and inverted.
 - 25 cm long and erect.
 - 25 cm long and inverted.
21. A magnifying glass is to be used at the fixed object distance of 10.0 mm. If it is to produce an erect image magnified 5.00 times, its focal length should be
- +2.0 mm
 - +8.0 mm
 - +12.5 mm
 - +50.0 mm
22. A lens placed 9.00 cm from a postage stamp produces a virtual image of it 3.00 cm from the lens. The lens has a focal length of
- 2.25 cm
 - +2.25 cm
 - 4.50 cm
 - +4.50 cm
23. An object 40 cm from a converging lens has an image 40 cm away from the lens on the other side. The focal length of the lens is
- 20 cm
 - 40 cm
 - 60 cm
 - 80 cm
24. A lens held 20.0 cm from an object forms a virtual image of it 10.0 cm from the lens. The focal length of the lens is
- 6.7 cm
 - +6.7 cm
 - 20 cm
 - +20 cm
25. A projector is intended to produce an image 140 cm wide of a slide 35.0 mm wide. If the projector is to be located 5.00 m from the screen, the focal length of the projector's lens should be
- +122 mm
 - +125 mm
 - 128 mm
 - +5.13 m
26. A convex mirror is ground with a radius of curvature of 12 cm. Its focal length is
- 6 cm
 - 24 cm
 - 6 cm
 - 24 cm
27. A pencil 10 cm long is placed 30 cm in front of a mirror of focal length +50 cm. The image is
- 2.5 cm long and erect.
 - 25 cm long and erect.
 - 0.25 m long and erect.
 - 25 cm long and inverted.
28. A pencil 10 cm long is placed 100 cm in front of a mirror of focal length +50 cm. The image is
- 3 cm long and erect.
 - 10 cm long and erect.
 - 3 cm long and inverted.
 - 10 cm long and inverted.
29. A pencil 10 cm long is placed 30 cm in front of a mirror of focal length -50 cm. The image is
- 25 cm long and erect.
 - 6.3 cm long and erect.
 - 25 cm long and inverted.
 - 6.3 cm long and inverted.
30. A 2 meter tall person stands 1 m in front of a plane mirror. How long must the mirror be in order for him to see himself completely?
- 4 m.
 - 2 m.
 - 1 m.
 - 0.5 m.
31. A 2 meter tall person stands 2 m in front of a plane mirror. How long must the mirror be in order for him to see himself completely?
- 4 m.
 - 2 m.
 - 1 m.
 - 0.5 m.

- b, c
- a
- b
- d
- b
- b
- a
- b
- b
- b
- a
- a
- a

- c
- d
- c
- c
- d
- d
- b
- c
- c
- a
- c
- a
- c

- b
- d
- b
- c
- b