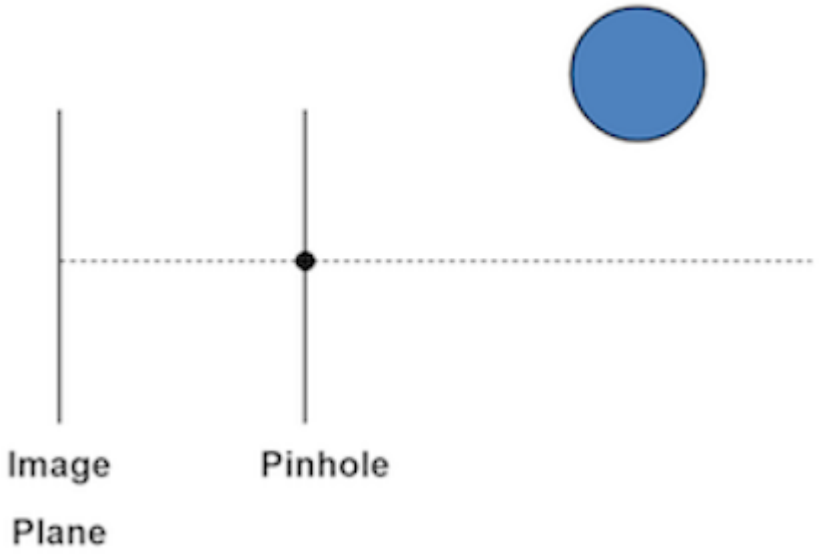
1. **1 point**

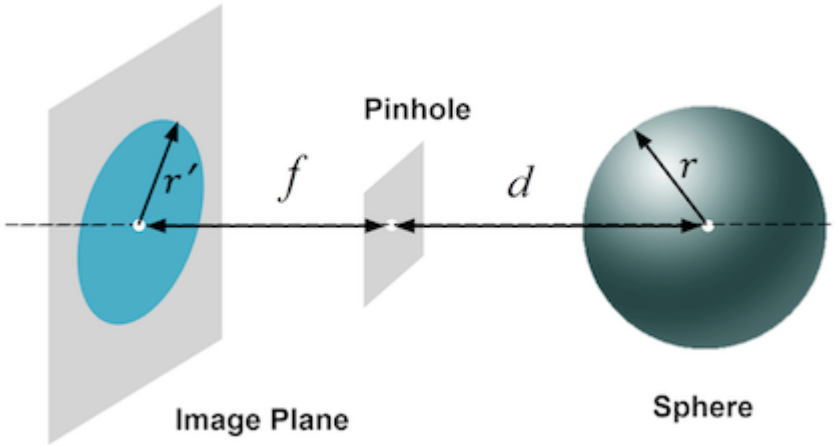


The shape of the image of the off-axis sphere imaged by a pinhole camera is:

Hint: Try to find the points in the sphere which will be visible from the pin hole. What 2D shape will it be? (Refer to the geometry of a circle's tangent.)

- ○ A circle
- ○ A square
- ○ A point
- ○ An ellipse

2. **2 points**



The image of a sphere of radius r placed on the optical axis of a pinhole camera is a circle with radius r'. If the distance d of the center of the sphere from the pinhole is doubled, the radius r' of the image of the sphere is:

- Exactly doubled
- Exactly halved
- Unchanged
- None of the above.

3. Consider a pinhole camera with an effective focal length of 2. If the pinhole is located at the origin and the image plane is given by $z = 2$, then the 3D image coordinates of the scene point (-4, 4, -2) are: **2 points**

- (4, 2, 1)
- (1, -1, 2)
- (4, -4, 2)
- (2, 2, 2)

4. **2 points**

How many vanishing points are produced by the edges of this opaque cube from

a fixed viewpoint?

- 1
- 2
- 3
- ∞

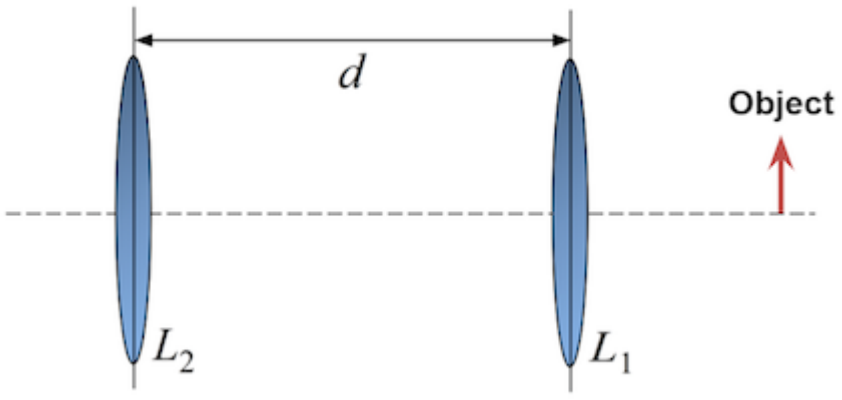
5. A focused imaging system has a magnification m and uses a lens with focal length f. The distance between the image plane and the object plane is: **3 points**

- $\frac{m-f}{f}$
- $(m+2+\frac{1}{m})f$
- $\frac{1+m}{f}$
- $m \cdot f$

6. Consider a camera with a single lens with focal length f. If the object distance is o and the image distance is i, the magnification is: **1 point**

- $m = \frac{1}{i} + \frac{1}{o}$
- $m = \frac{i-o}{i+o}$
- $m = 2f$
- $m = \frac{i}{o}$

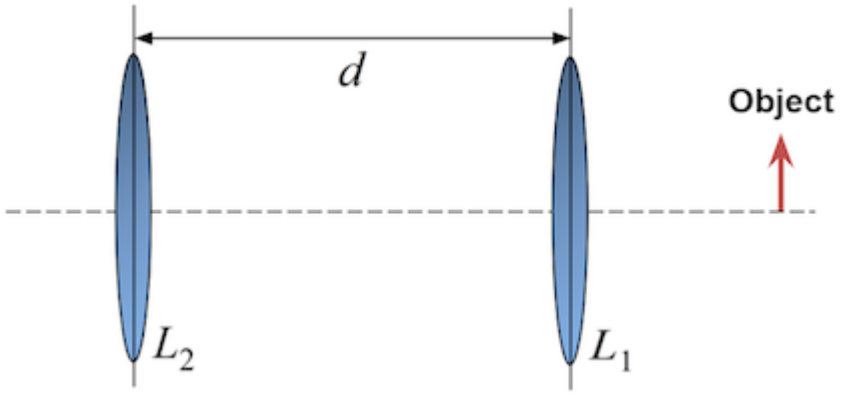
7. **2 points**



In this two-lens system, both lenses have the same focal length f = 5 cm and are separated by d = 20 cm. If the object is 2 cm tall and placed 10 cm away from lens L_1, how tall would its image behind lens L_2 be?

- 5 cm
- 4 cm
- 3 cm
- 2 cm

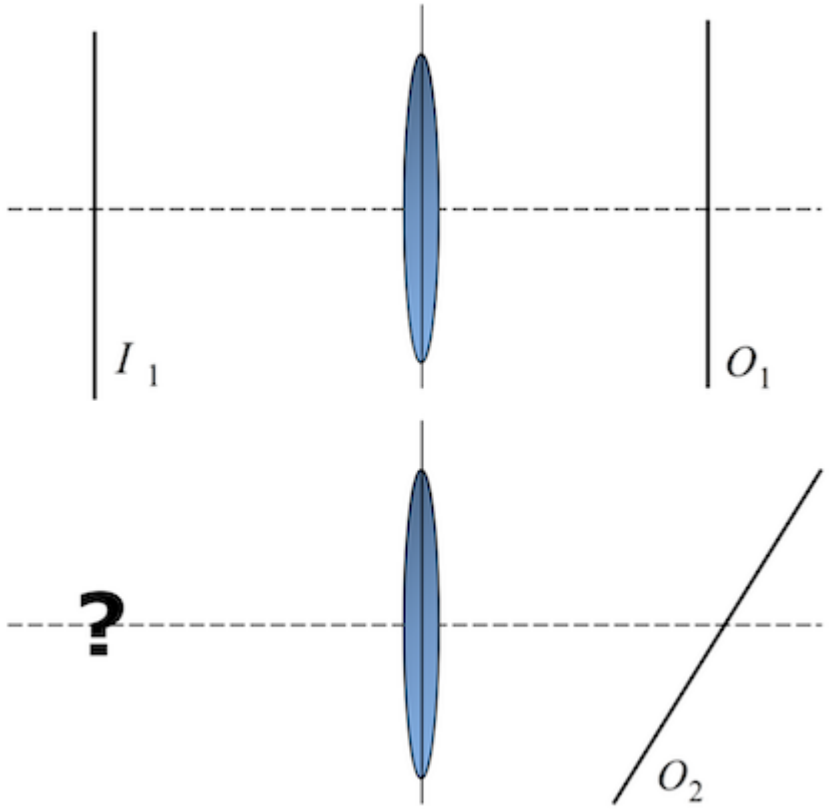
8. **3 points**



In this two-lens system, lens L_1 with focal length f_1 and lens L_2 with focal length f_2 are separated by $d = 2f_1$. What is the focal length f of the system?

- $\frac{f_1 f_2}{f_1+f_2}$
- $\frac{f_1 f_2}{f_2-f_1}$
- $\frac{1}{f_2} + \frac{1}{f_1}$
- $\frac{1}{f_2} - \frac{1}{f_1}$

9. **1 point**



We know the focused image of a vertical line O_1 is a vertical line I_1. The focused image of the tilted line O_2 is a:

- Tilted line
- Curve
- Point
- Vertical line

10. **1 point**

- Chromatic aberration
- Radial distortion
- Vignetting
- Tangential Distortion

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What is the lens effect you see in this image?

I, **PARVEJ ALAM ANSARI**, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account.

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