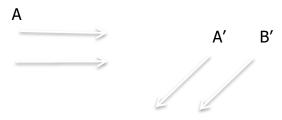1) A ray of light travels from air into glass with a refractive index of 1.5. If the speed of light in air is 3×10^8 m/s, what is the speed of light in glass?

2) An object is placed 10 cm from a convex lens of focal length 5 cm. Find the position of the image.

3) An object 5 cm high is placed 25 cm from a concave mirror of focal length 15 cm. Calculate the position, nature, and size of the image.

4) Light passes from air into a medium with a refractive index of 2. If the angle of incidence is 45°, find the angle of refraction. (sin 45°=1/√2)

5) An object 2 cm tall is placed 15 cm from a concave mirror which has a focal length of 10 cm. Calculate the magnification and the height of the image.

6) A convex lens forms a real image 20 cm from the lens when an object is placed 60 cm away. What is the focal length of the lens?

7) An object is placed 20 cm in front of a concave mirror whose focal length is 25 cm. Where is the image located?

8) Draw a ray diagram to show the refraction of light through a glass slab and explain the lateral shift of the light ray.

9) A light ray travelling in water (n=4/3) enters into glass (n=3/2). Find the ratio of velocities of light in glass to water.

10) A ray of light (λ=700nm) travelling in air into glass (n=1.5). Find its wavelength in glass.

11) Figure shows two rays A and B being reflected by a mirror and going as A′ and B′ then the mirror is

A

A′   B′

B

❖ Points to be remembered:

- Mirror formula
- Lens formula
- Magnification
- Snell's Law
- Refractive index

❖ Extra Points:
  - **Irregular reflection makes us to visible things**. If light gets regularly reflected then every object would act like a mirror and our surroundings would be illuminated. This would have a blinding effect on eyes making it harder for us to see.
  - $n = \dfrac{c}{v}$
  - $n = \dfrac{wavelength\ of\ light\ in\ air}{wavelength\ of\ light\ in\ medium}$
  - $\dfrac{n_2}{n_1} = \dfrac{v_1}{v_2}$
  - $v_1 = velocity\ of\ light\ in\ medium\ 1$
  - $v_2 = velocity\ of\ light\ in\ medium\ 2$