

Formulae On Light-Reflection & Refraction

- $f = \frac{R}{2}$
- Mirror formula: $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
- Magnification by mirror: $m = \frac{h}{H}$ or $m = \frac{-v}{u}$

- ❖ f = Focal length
- ❖ u = Object distance from pole of mirror
- ❖ v = Image distance from pole of mirror
- ❖ R = Radius of curvature of the mirror
- ❖ m = Magnification by mirror
- ❖ H = Object height
- ❖ h = Image height

- $n = \frac{c}{v}$
- Refractive index of medium 2 with respect to medium 1 is given by:

$${}^1n_2 = \frac{n_2}{n_1} = \frac{v_1}{v_2} = \frac{\sin i}{\sin r}$$

- ${}^1n_2 = \frac{1}{{}^2n_1}$

- ❖ n = Refractive Index
- ❖ c = Speed of light in vacuum
- ❖ v = Speed of light in medium
- ❖ n_1 = Refractive index of medium 1
- ❖ n_2 = Refractive index of medium 2
- ❖ v_1 = Speed of light in medium 1
- ❖ v_2 = Speed of light in medium 2
- ❖ i = Angle of incidence
- ❖ r = Angle of refraction

- Lens formula: $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$
- Magnification by lens: $m = \frac{h}{H}$ or $m = \frac{v}{u}$
- Power $P = \frac{1}{f \text{ (in m)}} = \frac{100}{f \text{ (in cm)}}$

- ❖ f = Focal length
- ❖ u = Object distance from optical centre
- ❖ v = Image distance from optical centre
- ❖ m = Magnification by lens
- ❖ H = Object height
- ❖ h = Image height

SIGN CONVENTION

	Concave mirror	Convex mirror	Concave Lens	Convex Lens
<i>u</i>	–	–	–	–
<i>v</i>	+ (virtual)/–(real)	+ (virtual)	– (virtual)	+ (real)/–(virtual)
<i>f</i>	–	+	–	+
<i>R</i>	–	+	–	+
<i>H</i>	+	+	+	+
<i>h</i>	+(virtual)/–(real)	+ (virtual)	+ (virtual)	–(real)/+(virtual)

➤ **Power of accommodation of Myopic Eye:**

Let u be the object distance, v be the image distance and f be the focal length of the correcting lens. Then:

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$i. e. \frac{1}{f} = \frac{1}{-v} - \frac{1}{\infty}$$

$$i. e. \frac{1}{f} = \frac{1}{-v}$$

$$i. e. f = -v$$

- ❖ *Image distance (v)* is negative as the image forms by a concave lens.
- ❖ *Object distance (u)* is infinity (∞) as the far point of any eye is at the infinity.

➤ **Power of accommodation of Hypermetropic Eye:**

Let u be the object distance, v be the image distance (in this case the defective or the shifted near point) and f be the focal length of the correcting lens. Then:

$$\frac{1}{f} = \frac{1}{-v} - \frac{1}{-u}$$

$$i. e. \frac{1}{f} = \frac{-u+v}{uv}$$

$$i. e. f = \frac{uv}{v-u}$$

- ❖ *Image distance (v)* is negative as the image forms is a virtual and upright image.
- ❖ *Object distance (u)* is always negative for any lens and in hypermetropic eye, u is considered as 25 cm or 0.25 m.

➤ **Power of combination of lenses:**

If lenses of power $P_1, P_2, P_3, \dots, P_n$ are combined then total power is given by:

$$P = P_1 + P_2 + P_3 + \dots + P_n$$



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HOW LEARNING HAPPENS HERE

-  CONCEPT CLARITY FIRST
-  REGULAR TESTS + FEEDBACK
-  DOUBT CLEARING SESSIONS
-  PERSONAL ATTENTION TO EVERY STUDENT
-  NO ROTE LEARNING METHODS

RESULTS ARE A BY-PRODUCT OF THE PROCESS

IS THIS COACHING CENTRE RIGHT FOR YOUR CHILD?

DOES YOUR CHILD

-  STRUGGLE WITH CONCEPT?
-  NEED PERSONAL ATTENTION?
-  AFRAID OF MATHS & SCIENCE?
-  WANT STRONG FUNDAMENTALS?
-  HATE ROTE LEARNING?

IF YES, THEN YOU'RE IN THE RIGHT PLACE.

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