

Homework

1. Given,

$$u = -45 \text{ cm}$$

$$v = 90 \text{ cm}$$

$$f = ?$$

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

$$= \frac{1}{f} = \frac{1}{90} - \left(\frac{1}{-45} \right)$$

$$= \frac{2+1}{90}$$

$$= \frac{3}{90}$$

$$= \frac{1}{30}$$

$$f = +30 \text{ cm}$$

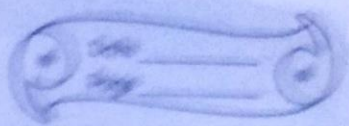
when, $u = -45 - 5 = -50$

$$f = 30$$

$$v = ?$$

$$\frac{1}{30} = \frac{1}{v} + \frac{1}{50}$$

$$\frac{1}{v} = \frac{5+3}{150} = \frac{8}{150} = \frac{2}{75}$$



$$\Rightarrow \frac{1}{v} = \frac{1}{75}$$

$$\Rightarrow v = 75 \text{ cm}$$

$$\text{Displacement} = 90 - 75 = 15 \text{ cm}$$

$$\begin{aligned} \text{Power} &= \frac{1}{f} \\ &= \frac{1}{30} \end{aligned}$$

2. ~~Power~~ Power of 1st lens = 3D
Power of 2nd lens = -1.5D

Sol- ^{Conv} Emergent as $P = P_1 + P_2$
 $= 3D + -1.5D$
 $= +1.5$

3 The net focal length of combination

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$$

$$\Rightarrow \frac{1}{25} + \frac{1}{20}$$

$$\therefore -\frac{1}{100}$$

$$\Rightarrow f = -100 \text{ cm}$$

$$\text{Power of combination} = P = P_1 + P_2 = \frac{1}{f_1} + \frac{1}{f_2}$$

$$P = \frac{1}{0.25} + \frac{1}{0.20} = \frac{100}{25} + \frac{100}{20}$$

$$= \frac{400 + 500}{100} = \frac{-100}{100} = -1$$

$$\Rightarrow P = -1D$$

A. $f = 20 \text{ cm}$

$$P = \frac{100}{f} = +5D$$

$$\Rightarrow P = P_1 + P_2$$

$$P_1 + P_2 = 5$$

$$(10, -5)$$

ii) $f = \frac{20}{3} \text{ cm}$

$$P = \frac{100}{20/3} = 15D$$

$$P = P_1 + P_2 = 15$$