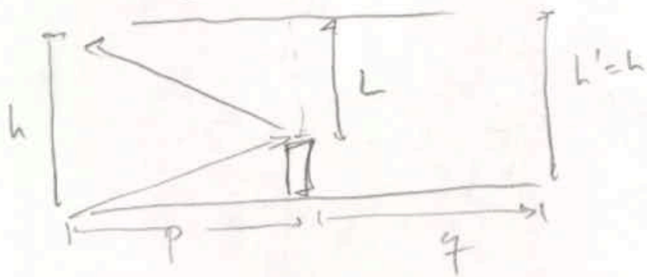
Ch. 26 Sol'n's

#3 $R = \infty$, $f = \infty$; $1/f = 0$; $1/p + 1/q = 1/f \Rightarrow \boxed{q = -p}$ Behind Mirror.

$M = -\frac{p}{q} = 1 = \frac{h'}{h} \Rightarrow h' = h = \boxed{70'}$

Required height:



$h'\left(\frac{p}{p-q}\right) = h'\frac{p}{2p} = \frac{h'}{2}$; $\Rightarrow \boxed{35' \text{ high}}$

#9 (A) $\frac{1}{p} + \frac{1}{q} = \frac{2}{R} \Rightarrow \boxed{q = -12\text{ cm}}$

(B) " $\Rightarrow \boxed{q = -15\text{ cm}}$

(C) $M > 0 \Rightarrow \boxed{\text{upright}}$

#11 (A) $\frac{1}{p} + \frac{1}{q} = \frac{2}{R} \Rightarrow \boxed{q = 45\text{ cm}}$ & $\boxed{M = -\frac{1}{2}}$ $\Rightarrow$ real, inverted

(B) " $\Rightarrow \boxed{q = -60\text{ cm}}$ & $\boxed{M = +3}$ $\Rightarrow$ virtual upright

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#17 (A) $q = (p + 5m)$ & real image $\Rightarrow M = -q/p = -5$ or $q = 5p$

$p = 1.25m$ from $p + 5 = 5p$. $\frac{1}{q} + \frac{1}{p} = \frac{2}{R}$ solve for R:

$R = \frac{2pq}{p+q} = \boxed{2\text{ m concave}}$

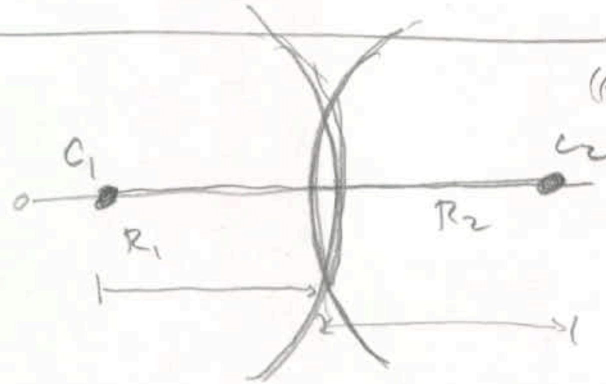
(B) $p = 1.25m \Rightarrow \boxed{\Delta d = 1.25m}$

#23 Refraction @ flat surface: $\frac{n_1}{p} + \frac{n_2}{q} = \frac{n_2 - n_1}{R}$

$q = \frac{n_2 R p}{p(n_2 - n_1) - n_1 R}$; plug in #'s w/ $\boxed{p = 10\,cm}$

gives $q = \boxed{-8.57\,cm}$; $\boxed{d = 8.57\,cm}$

#27



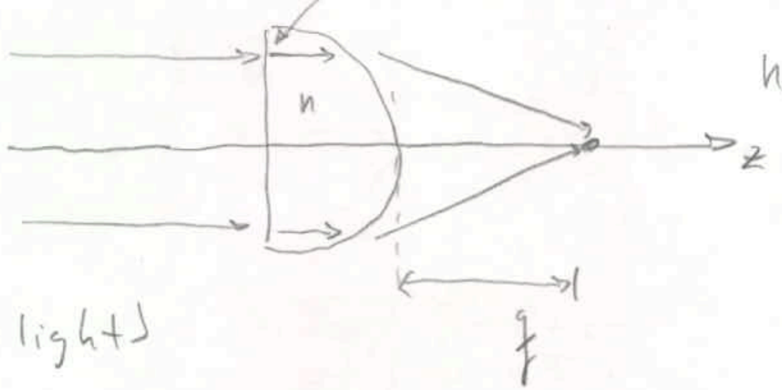
(A) $1/f = (n-1)\left[\frac{1}{R_1} - 1/R_2\right] \Rightarrow$

$\boxed{f = 16.4\,cm}$

(B) $f = \boxed{16.4\,cm}$

#49

snell's law ⇒ $\theta_{transmitted} = 0$ since $\theta_{incident} = 0$



$n_{air} = 1$

$n = 1.56$

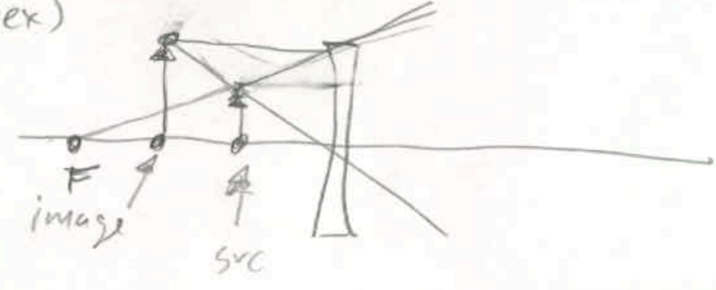
$p = \infty$ (parr. light)

$0 + \frac{1}{q} = \frac{1 - n}{-6\,cm} \Rightarrow \boxed{q = 10.7\,cm}$

#35 $R < 0$ (convex)

$1/p + 1/q = \frac{1}{(-R)}$

$\Rightarrow \boxed{q = -12.3\,cm}$



$M = 0.61570$

upright.