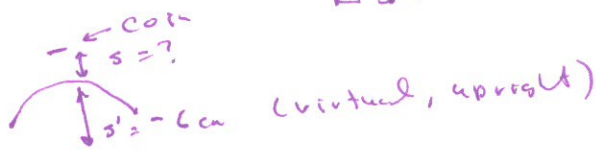


ch 34 : 9, 11, 15 class 14

9

$R = 18 \text{ cm} \Rightarrow F = -9 \text{ cm}$
 $\frac{1}{s} + \frac{1}{-6} = \frac{1}{-9}$
 $s = 18 \text{ cm}$



$M = -\frac{s'}{s} = \frac{6}{18} = \frac{1}{3}$; $h' = h/M = 1.5 \cdot \frac{1}{3} = .5 \text{ cm}$

11)



$R = 32 \Rightarrow F = +16$

$\frac{1}{s} + \frac{1}{s'} = \frac{1}{12} + \frac{1}{s'} = \frac{1}{16}$

$\Rightarrow s' = -48 \text{ cm}$
virtual upright

see attached for rays

$M = \frac{-48}{12} = 4$

15)

a: $R = 12 \Rightarrow F = +6$

$\frac{1}{15} + \frac{1}{s'} = \frac{1}{6} \Rightarrow s' = \frac{10}{3} \text{ cm}$

real, inverted

size = $3.3 \text{ mm} \left(\frac{-s'}{s} \right) = 3.3 \cdot \frac{-10}{15} = 2.2 \text{ mm}$

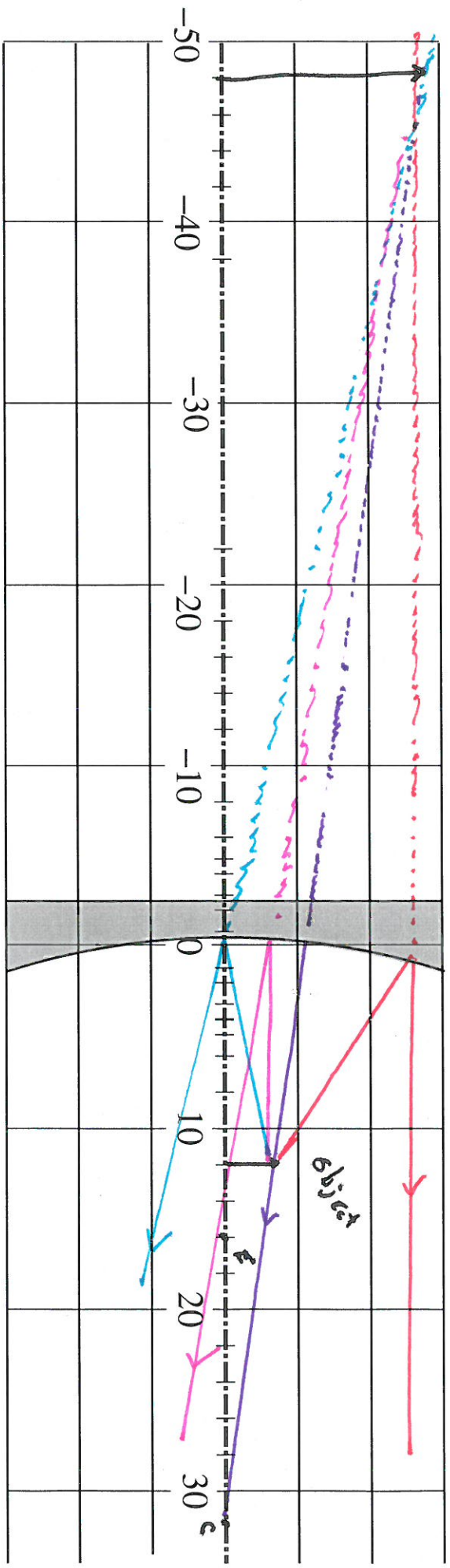
b $R = 12 \Rightarrow F = -6$

$\frac{1}{15} + \frac{1}{s'} = \frac{-1}{6} \Rightarrow s' = -4.3 \text{ cm}$

↑
virtual upright

size = $3.3 \left(\frac{4.3}{15} \right) = .94 \text{ mm}$

10000



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