

Ex. 23.8 # 34, 35, 37, 40

a) $f = \ominus 10 \text{ cm}$ ^{div. lens}

$p = 30 \text{ cm}$

$\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$

$\frac{1}{10} - \frac{1}{30} = \frac{1}{q}$

$q = \ominus 7.5 \text{ cm}$ ^{virtual}

describe q

$M = \frac{-q}{p} = \frac{-(-7.5)}{30} = .25$

q smaller than p ✓
or $h' < h$

b) $p = 10 \text{ cm}$

$M+$ upright ✓

$-\frac{1}{10} - \frac{1}{10} = \frac{1}{q}$

$-\frac{2}{10} = \frac{1}{q}$

$\ominus 5 \text{ cm} = q$

q smaller than p ✓

$-q$ virtual ✓

$M+$ upright ✓

c) $p = 5 \text{ cm}$

$-\frac{1}{10} - \frac{1}{5} = \frac{1}{q}$

$-3.3 \text{ cm} = q$

$M = \frac{-q}{p} = \frac{-(-3.3)}{5} = .67$

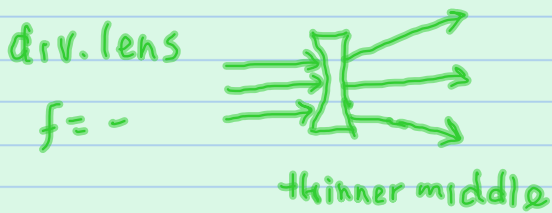
q smaller than p

$-q$ virtual

$M+$ upright

$\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$

$M = \frac{-q}{p} = \frac{h'}{h}$



lens maker eq.

$\frac{1}{f} = (n-1) \left(\frac{1}{R_1} - \frac{1}{R_2} \right)$

