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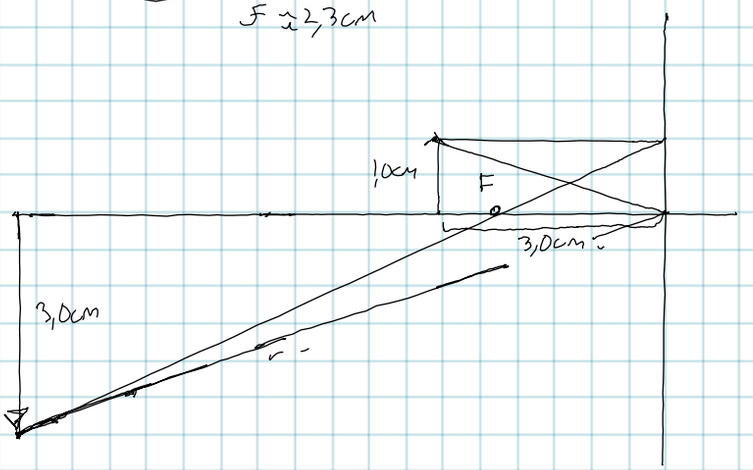
T4-8

$f \approx 2{,}3\,cm$



T4-9

$f = 10\,cm$

$m = 2{,}0$

$m = \left|\frac{b}{a}\right| = 2{,}0$

a) $b = 2{,}0 \cdot a$

$\frac{1}{a} + \frac{1}{b} = \frac{1}{f}$ $\quad \frac{3}{2a} = \frac{1}{f}$

$\frac{1}{a} + \frac{1}{2a} = \frac{1}{f}$ $\quad a = \frac{3f}{2} = \frac{3 \cdot 10\,cm}{2} = 15\,cm$

b) $b < 0$, $a > 0$ $\quad \frac{1}{a} + \frac{1}{b} = \frac{1}{f}$ $\quad \frac{1}{2a} = \frac{1}{10\,cm}$

$b = -2{,}0a$ $\quad \frac{1}{a} + \frac{1}{-2a} = \frac{1}{f}$ $\quad a = 5{,}0\,cm$

T4-10

$a = 15\,cm$ $\quad \frac{k}{e} = \frac{|b|}{|a|} = 2{,}0$ $\quad |b| = 2{,}0 \cdot a = 2{,}0 \cdot 0{,}15\,m = 0{,}30\,m$

$b = -0{,}30\,m$

$\frac{1}{a} + \frac{1}{b} = \frac{1}{f}$

$f = \frac{a \cdot b}{a+b} = \frac{0{,}15\,m \cdot (-0{,}30\,m)}{0{,}15\,m - 0{,}30\,m} = 0{,}30\,m = 30\,cm$