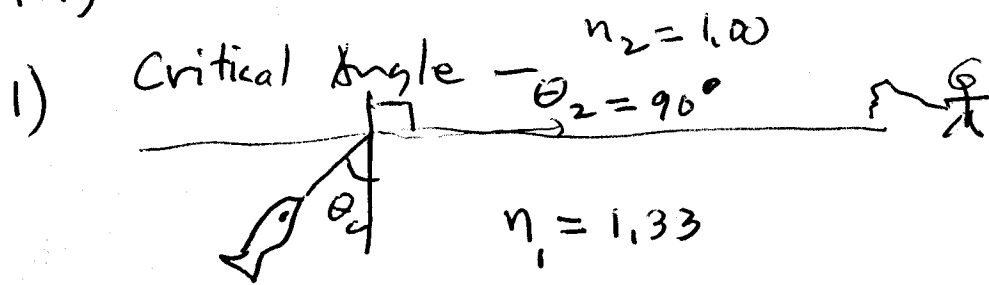


Physics 1C
Winter 2010

Quiz 2 form A



Snells Law -

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$\sin \theta_1 = \frac{n_2}{n_1} \sin \theta_2 = \frac{1(1)}{1.33} = 0.752$$

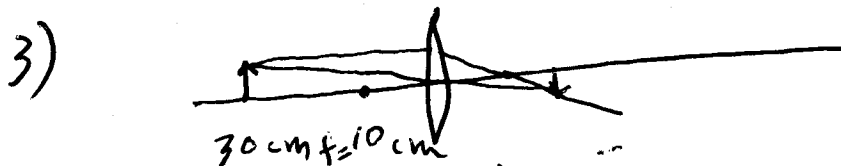
$$\theta_1 = 48^\circ$$



$$m = \frac{25 \text{ cm}}{f}$$

$$f = \frac{25 \text{ cm}}{m} = \frac{25}{5} = 5 \text{ cm} = 0.05 \text{ m}$$

$$P = \frac{1}{f} = \frac{1}{0.05} = 20 \text{ m}^{-1} \text{ (diopters)}$$

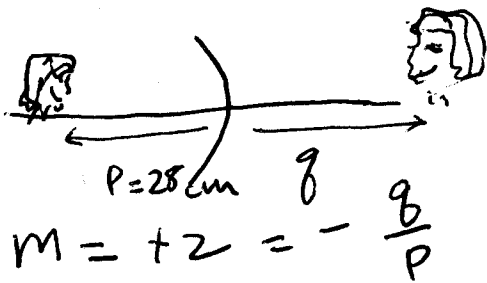


$$P = \frac{1}{p} + \frac{1}{q} = \frac{1}{f}$$

$$q = \frac{pf}{p-f} = \frac{(30)(10)}{30-10} = 15 \text{ cm}$$

$$m = -\frac{q}{p} = -\frac{15}{30} = -0.5$$

4)



$$M = +2 = -\frac{q}{P}$$

$$q = -2P$$

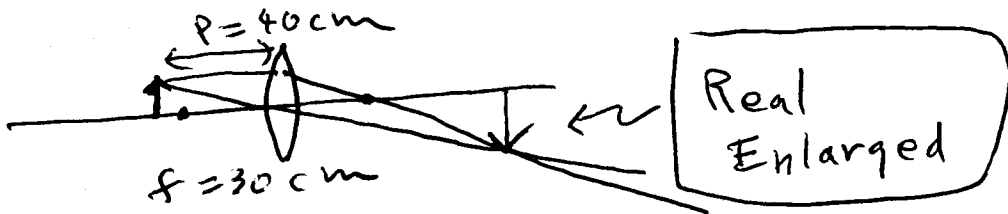
$$\frac{1}{P} + \frac{1}{q} = \frac{1}{f}$$

$$\frac{1}{P} - \frac{1}{2P} = \frac{1}{f}$$

$$\frac{2-1}{2P} = \frac{1}{f}$$

$$f = 2P = 2(28) = \boxed{56 \text{ cm}}$$

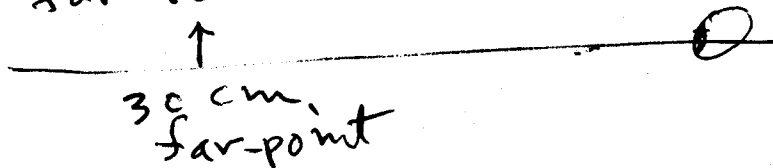
5)



$$q = \frac{Pf}{P-f} = \frac{(40)(30)}{40-30} = 120 \text{ cm}$$

$$m = -\frac{q}{P} = -\frac{120}{40} = -3$$

6) Nearsighted - To correct to normal vision, an object at ∞ produces a virtual image at the far-point



$$P = \infty \quad q = -30 \text{ cm}$$

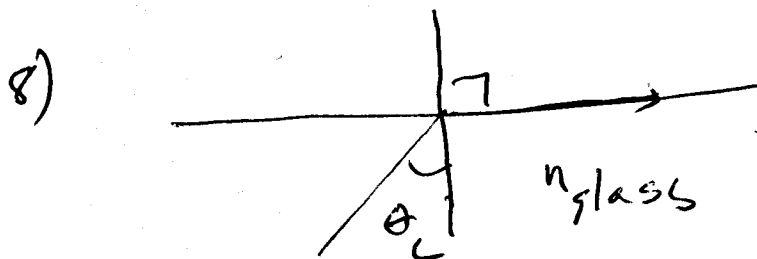
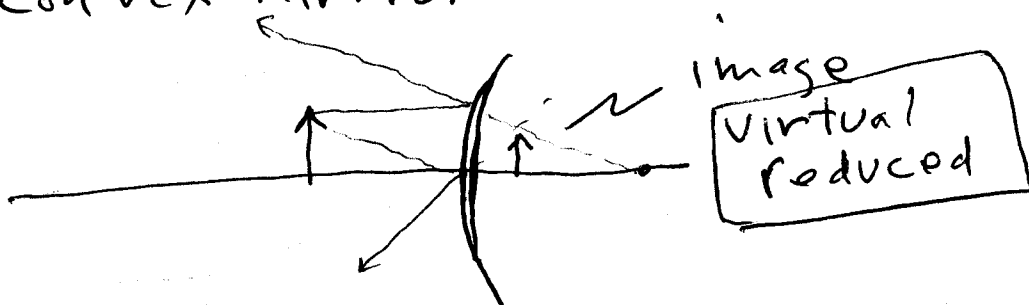
$$\frac{1}{P} + \frac{1}{q} = \frac{1}{f}$$

$$\frac{1}{\infty} + \frac{1}{q} = \frac{1}{f} \quad f = q = -30 \text{ cm}$$

continued

$$6) P = \frac{1}{f} = \frac{1}{-0.3 \text{ m}} = \boxed{-3.33 \text{ diopters}}$$

7) Convex mirror



$$n_g \sin \theta_c = 1$$
$$\sin \theta_c = \frac{1}{n_g}$$

~~Req~~ θ_c increases as n_g decreases
 n_g is lowest for red light
 $\therefore \theta_c$ is greatest for red light