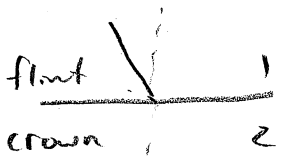
Chapter 16

2. A 3. C 8. C 9. A

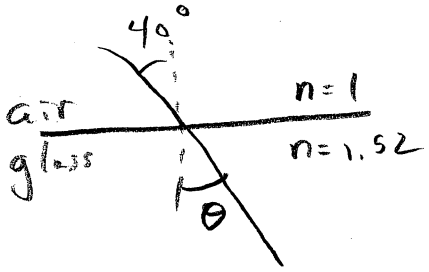
14. D $\frac{n_2}{n_1} = \frac{\sin\theta_1}{\sin\theta_2}$ $\theta_2 = 90°$



$\theta_c = \sin^{-1}\left(\frac{n_2}{n_1}\right)$

$= \sin^{-1}\left(\frac{1.52}{1.66}\right) = 66.3°$

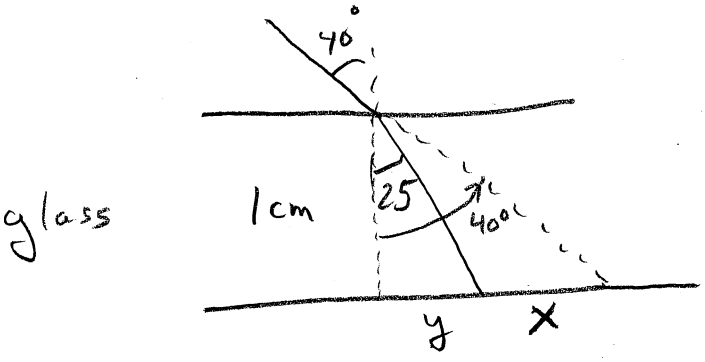
15. D air – glass



$\frac{n_2}{n_1} = \frac{\sin\theta_1}{\sin\theta_2}$

$\frac{1.52}{1} = \frac{\sin 40}{\sin\theta}$

$\theta = 25.0°$



length y: $\tan 25 = \frac{y}{1cm}$ $y = 0.466$ cm

length x+y: $\tan 40 = \frac{(x+y)}{1}$ $x+y = .839$ cm

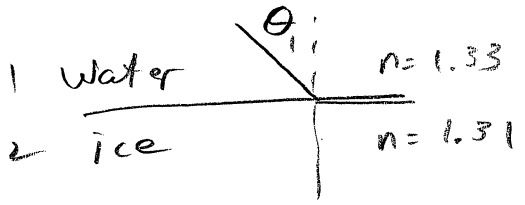
$(x+y) - y = x$

$.839 - .466 = .373$ cm

23. A 24. C 25. B 30. D

31. A

34. D

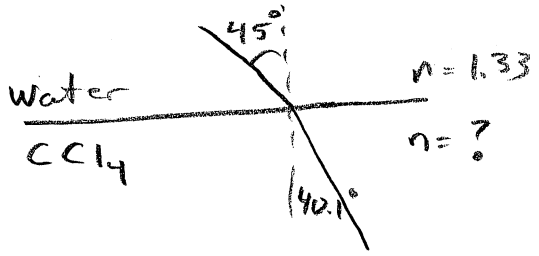


$$\frac{n_2}{n_1} = \frac{\sin\theta_1}{\sin\theta_2} \qquad \theta_2 = 90^\circ$$

$$\theta_c = \sin^{-1}\left(\frac{n_2}{n_1}\right) = \sin^{-1}\left(\frac{1.31}{1.33}\right)$$

$$\theta_c = 80.1^\circ$$

35. D



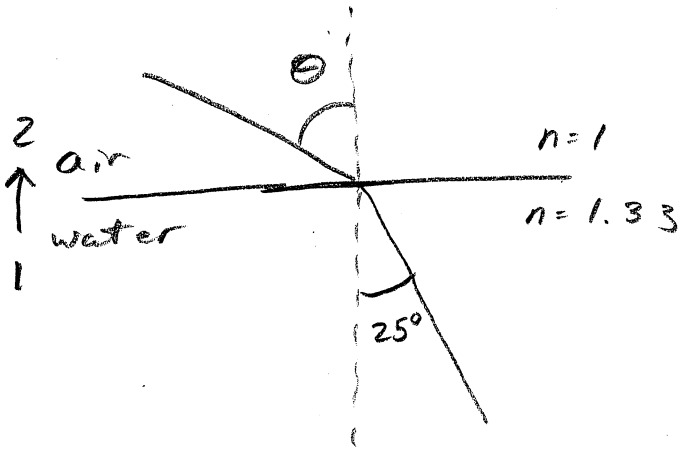
$$\frac{n_2}{n_1} = \frac{\sin\theta_1}{\sin\theta_2}$$

$$\frac{n_2}{1.33} = \frac{\sin 45}{\sin 40.1}$$

$$n = 1.46$$

36. B

45. D



$$\frac{n_2}{n_1} = \frac{\sin\theta_1}{\sin\theta_2}$$

$$\frac{1}{1.33} = \frac{\sin 25}{\sin\theta} \qquad \theta = 34.2°$$

46. D