

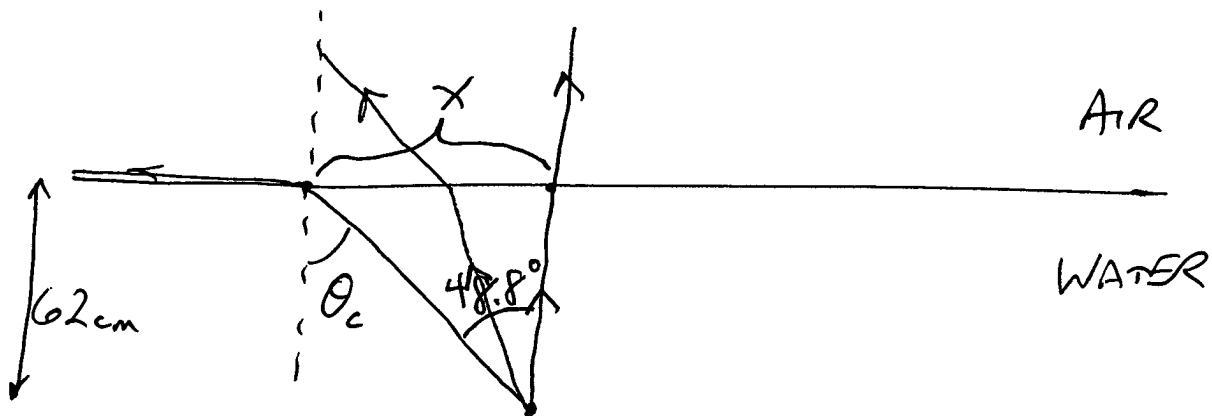
2012 MAR 26

(GG, Ch 23, P 36)

$$\theta_c = \sin^{-1}\left(\frac{n_{\text{LOW}}}{n_{\text{HIGH}}}\right) = \sin^{-1}\left(\frac{1.33}{1.51}\right) \\ = 61.7^\circ$$

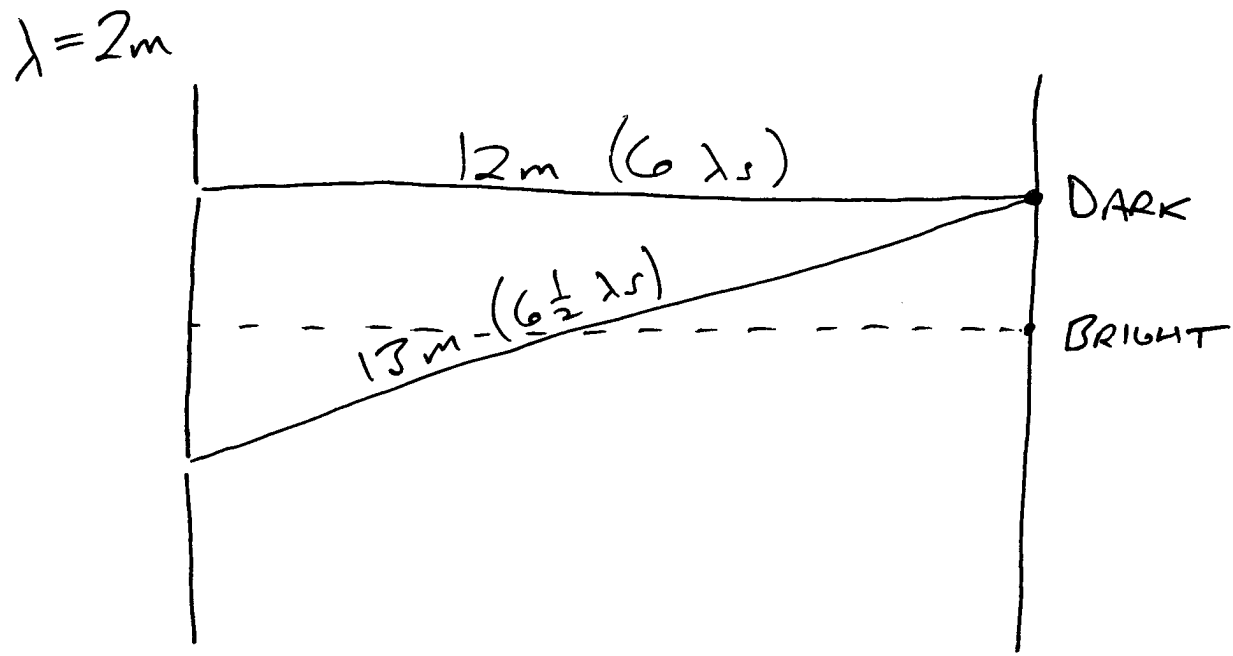
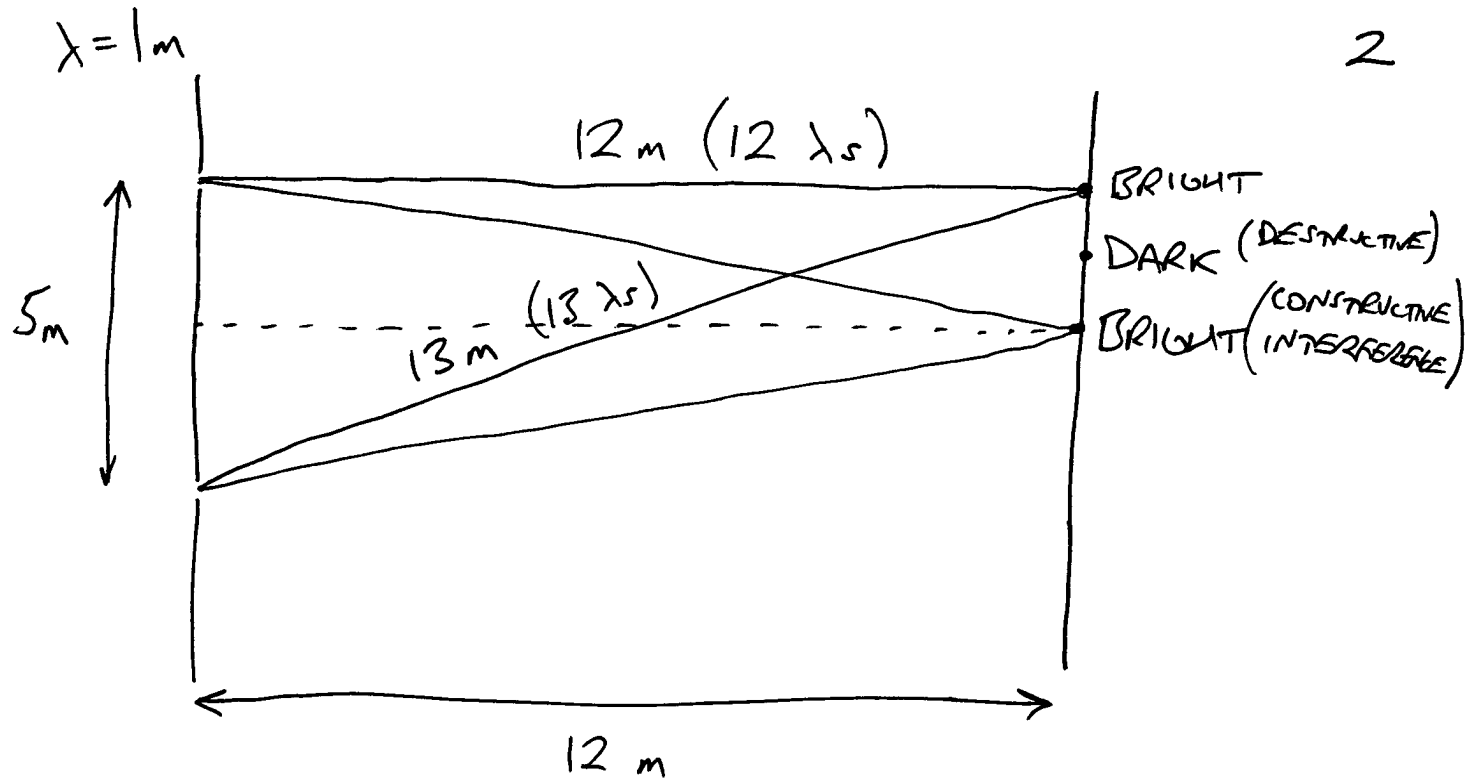
TO HAVE TOTAL INTERNAL REFLECTION,  
LIGHT MUST START IN THE HIGH-INDEX  
MATERIAL, IN THIS CASE LUCITE.

(GG, Ch 23, P 38)



$$\theta_c = \sin^{-1}\left(\frac{1}{1.33}\right) = 48.8^\circ$$

$$\tan 48.8^\circ = \frac{x}{62\text{cm}} \Rightarrow x = 71\text{cm}$$



## PROBLEM 1

$$(a) \quad F = qE$$

$$= 6.4 \times 10^{-17} \text{ N WEST}$$

$$(b) \quad F = qvB \sin \theta$$

$$= 3.2 \times 10^{-17} \text{ N EAST}$$

$$(c) \quad F_{\text{NET}} = 3.2 \times 10^{-17} \text{ N WEST}$$

PROBLEM 2

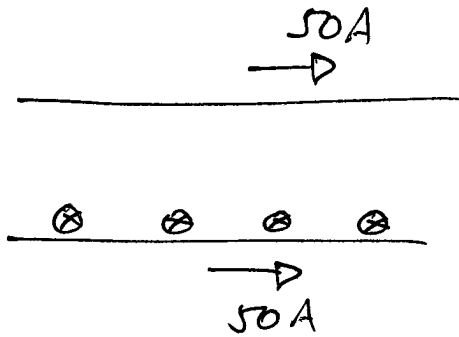
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$2.4\ \Omega$      $4.8\ \overset{V}{\cancel{\Omega}}$     LEFT    2A    RIGHT

$6\ \Omega$     7.2V    LEFT    1.2A    RIGHT

# PROBLEM 3

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$$(a) \quad B = \frac{\mu_0 I}{2\pi r} = 5 \times 10^{-5} \text{ T} \quad \text{INTO PAGE}$$

$$(b) \quad F = I l B \sin \theta \\ = 1.25 \times 10^{-2} \text{ N} \quad \text{UPWARD}$$