

ASSIGNMENT

1) There are two conditions for Total Internal Reflection of light to take place:

(a) light has to travel from denser medium to rarer medium but not vice-versa.

(b) Critical angle of the media θ_c

Angle of incidence (θ) must be greater than the critical angle of medium (θ_c).

2) ~~Refractive index = $\frac{\text{Actual depth}}{\text{Apparent depth}}$~~

~~Actual depth = Apparent depth \times Refractive index.~~

~~Actual depth = $\frac{3}{6} \times \frac{3}{42} = \frac{9}{2} = 4.5$.~~

$$2 \rightarrow \text{Refractive index } ({}^w \mu_a) = \frac{3}{4}$$

$$\text{Refractive index } ({}^a \mu_w) = \frac{4}{3}$$

$$\text{Apparent depth} = 6 \text{ cm}$$

$$\text{Actual depth} = \text{Refractive Index } ({}^a \mu_w) \times$$

$$\left[\left(\frac{\text{Actual}}{\text{Apparent}} = \mu \right) \right] \quad \text{Apparent depth}$$

$$\text{Actual depth} = \frac{4}{3} \times 6 = 8 \text{ cm}$$

$$3 \rightarrow \text{Refractive index} = \frac{\text{Actual depth}}{\text{Apparent depth}}$$

$$\mu = \frac{(8 \text{ cm})}{\text{Apparent Depth}}$$

$$1.6 \text{ cm} = \frac{8 \text{ cm}}{\text{Apparent Depth}}$$

$$\Rightarrow \text{Apparent Depth} = \frac{8 \text{ cm}}{1.6 \text{ cm}}$$

$$\Rightarrow \text{Apparent Depth} = 5 \text{ cm}$$

The letters are raised by a sum of $(8-5) \text{ cm}$
 $= 3 \text{ cm}$