

1. The two important conditions for total internal reflection are:

i) Angle of incidence should be greater than the critical angle

ii) Ray should travel from denser medium to rarer medium.

2. 
$$\frac{\text{real depth}}{\text{apparent depth}} = \frac{d}{d'} = \mu$$

$$\text{So } \frac{3}{4} = \frac{6}{y}$$

$$3y = 24$$
$$y = 8 \text{ cm.}$$

$$\text{apparent depth} = 8/1.6$$

$$\text{real depth} = \frac{80}{16} = 5 \text{ cm}$$

normal shift = real depth - apparent

$$8 - 5 \text{ cm} = 3 \text{ cm}$$