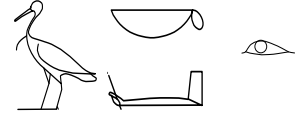


HOMEWORK



CALCULS (les réponses numériques sont indiquées : ans(=answer) pour vérifier vos calculs)

Refraction Homework

1. A ray of light travelling through air is incident upon a sheet of crown glass ($n=1.52$) at an angle of 30° to the normal. What is the angle of refraction? Ans: 19.2°

2. A ray of light passes into water from air at an angle of 50° to the lake's surface. What is the angle of refraction? What is the speed of light in the water? Ans: 28.9° ; $2.25 \times 10^8 \text{m/s}$

3. Calculate the speed of light in a diamond. Ans: $1.24 \times 10^8 \text{m/s}$.

4. A block of unknown material is submerged in water. Light in the water is incident on the surface at an angle of 31° . The angle of refraction is 27° . What is the speed of light in the unknown material? Ans: $1.20 \times 10^8 \text{m/s}$

5. What is the critical angle for light rays passing from diamond ($n=2.42$) into air? Ans: 24.42°

6. What is the critical angle for light rays passing from quartz ($n=1.54$) into water ($n=1.33$)? Ans: 59.73°

7. The critical angle for light rays passing from water into air is 48.75° . What is the index of refraction of water? Ans: 1.33

Index of Refraction

$n = c/v$
The larger the index,
the smaller the speed of
light

Ratio of Speed of Light in
Vacuum to Speed in Various ($\lambda = 589 \text{ nm}$)

Substance	c/v	Substance	c/v
Diamond	2.419	Ethyl Alcohol	1.361
Cubic Zirconia	2.21	Ice	1.309
Glass (flint)	1.66	Water	1.333
Glass (crown)	1.52	Air	1.000