Monochromatic light enters an equilateral prism made of glass with index of refraction 1.42 in such a way that, after refraction at the first surface, the light travels parallel to the base of the prism,
30
o
What must be the angle of incidence of the light for this to occur?
Answer in units of
◦

Solution:

According to Snell's law:

$$n = \frac{sin\theta_1}{sin\theta_2}$$

$$were\ \theta_1\ -\ the\ angle\ of\ incidence, \theta_2 - the\ angle\ of\ refraction,\quad n - refraction\ index$$

$\theta_2 = 30°$

$n = 1.42$

$sin\theta_1 = nsin\theta_2$

$\theta_1 = \arcsin(nsin\theta_2) = \arcsin(1.42 * sin30°) = 45.23°$

Answer: $45.23°$ or $45.23 - 30 = 15.23°$ *to the base of the prism*.