MP|399

air → liquid

air
$n_i = 1.00$
$\theta_i = 65.0°$

liquid
$n_r = ?$
$\theta_r = 42.0°$

air → liquid

$n_i \sin\theta_i = n_r \sin\theta_r$

$(1.00)\sin 65.0° = n_r(\sin 42.0°)$

$n_r = \dfrac{(1.00)\sin 65.0°}{\sin 42.0°}$

$n_r = 1.35$

MP|404

air → ruby

air
$n_i = 1.00$
$\theta_i = 45°$

ruby
$n_r = 1.54$
$\theta_r = ?$

air → ruby

$n_i \sin\theta_i = n_r \sin\theta_r$

$(1.00)\sin 45° = (1.54)\sin\theta_r$

$\sin\theta_r = \dfrac{(1.00)\sin 45°}{1.54}$

$\theta_r = \sin^{-1}(\text{stuff})$

$\theta_r = 27°$