$\lambda = 541\ nm = 541 \times 10^{-9}\ m$

$d = \frac{1}{400\ mm} = .0025\ mm = 2.5 \times 10^{-6}\ m$

$m = 2$

a) $m \cdot \lambda = d \cdot \sin\theta$

$(2)(541 \times 10^{-9}\ m) = (2.5 \times 10^{-6}\ m) \cdot \sin\theta$

$\theta = 25.6°$

b) Find v_{H_2O}: $n = \frac{c}{v}$

$(1.33) = \frac{(3 \times 10^8\ m/s)}{v}$

$v = 2.25 \times 10^8\ m/s$

Find λ in H_2O:

f is constant so $\frac{v_1}{\lambda_1} = \frac{v_2}{\lambda_2}$

$\frac{(3 \times 10^8\ m/s)}{(541 \times 10^{-9}\ m)} = \frac{(2.25 \times 10^8\ m/s)}{\lambda_2}$

$\lambda_2 = 4.07 \times 10^{-7}\ m$

Find new θ: $m \cdot \lambda = d \cdot \sin\theta$

$(2)(4.07 \times 10^{-7}\ m) = (2.5 \times 10^{-6}\ m) \cdot \sin\theta$

$\theta = 19.0°$