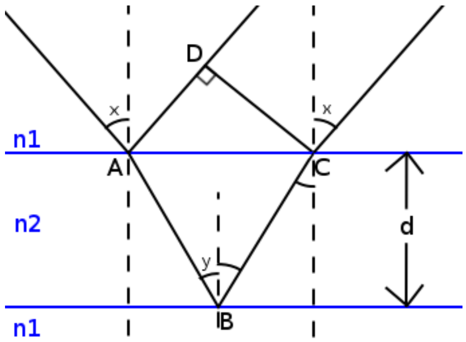
We can compute for the minima in reflectance by considering the destructive interference in thin films. Consider the more general case where we have a light in the first medium, and this light strikes a surface with a different index of refraction The surface has a thickness d.



In order to compute for the *optical path difference*, we need to find the length in the path that the refracted light took in the region where n_2, and subtract it with the distance AD, the difference between the two reflected waves. Hence we have

$$OPD = n_2(AB + BC) - n_1(AD) \tag{1}$$

From the geometry, we have

$$AB = BC = \frac{d}{\cos y} \tag{2}$$

as well as $AC = 2d \tan y$ and $\angle ACD = x$. With these,

$$AD = 2d \tan y \sin x \tag{3}$$

hence

$$OPD = n_2 \frac{2d}{\cos y} - n_1 2d \tan y \sin x \tag{4}$$

Using the law of refraction $n_1 \sin x = n_2 \sin y$,

$$OPD = 2dn_2 \left(\frac{1}{\cos y} - \tan y \sin y \right) \tag{5}$$

Using some trigonometric identities,

$$OPD = 2dn_2 \cos y \tag{6}$$

Since $n_2 > n_1$, there will be a phase shift of π in the reflection at point A. We include this in the value of the optical path difference by adding a half-integer multiple of the wavelength λ. For destructive interference of reflected light, we want the OPD to be equal to a half-integer multiple of the wavelength. Hence,

$$2dn_2 \cos y = m\lambda \tag{7}$$