

$$d/L = \sin(\theta_{\text{air}} - \theta_{\text{glass}}) = \sin\theta_{\text{air}} \cos\theta_{\text{glass}} - \cos\theta_{\text{air}} \sin\theta_{\text{glass}}.$$

$$w/L = \cos\theta_{\text{glass}}.$$

Therefore

$$d/w = (\sin\theta_{\text{air}} \cos\theta_{\text{glass}} - \cos\theta_{\text{air}} \sin\theta_{\text{glass}}) / \cos\theta_{\text{glass}}$$

$$= \sin\theta_{\text{air}} - \cos\theta_{\text{air}} \sin\theta_{\text{glass}} / \cos\theta_{\text{glass}}$$

$$= \sin\theta_{\text{air}} - \cos\theta_{\text{air}} \sin\theta_{\text{air}} / (n \cos\theta_{\text{glass}})$$

$$= \sin\theta_{\text{air}} - \cos\theta_{\text{air}} \sin\theta_{\text{air}} / (n (1 - \sin^2\theta_{\text{glass}})^{1/2})$$

$$= \sin\theta_{\text{air}} - \cos\theta_{\text{air}} \sin\theta_{\text{air}} / (n^2 - n^2 \sin^2\theta_{\text{glass}})^{1/2}$$

$$= \sin\theta_{\text{air}} - \cos\theta_{\text{air}} \sin\theta_{\text{air}} / (n^2 - \sin^2\theta_{\text{air}})^{1/2}$$

$$= \sin\theta_{\text{air}} (1 - \cos\theta_{\text{air}} / (n^2 - \sin^2\theta_{\text{air}})^{1/2}).$$