Maths of the Day

$$\int_0^{\frac{\pi}{2}} \ln[x^2 + \ln^2 \cos x]dx = \frac{\pi}{2} \ln \ln 2$$

$$\int_0^{\frac{\pi}{2}} \ln[x^2 + \ln^2 \cos x] \cos 2x \ dx = -\frac{\pi}{\ln 2}$$

$$\int_0^{\frac{\pi}{2}} \frac{\ln \cos x}{x^2 + \ln^2 \cos x} dx = \frac{\pi}{2}\left(1 - \frac{1}{\ln 2}\right)$$

$$\int_0^{\frac{\pi}{2}} \frac{x \sin 2x}{x^2 + \ln^2 \cos x} dx = \frac{\pi}{4 \ln^2 2}$$