In Peskin Schroeder from formula 5.87 which is

$$\frac{1}{4}\sum M^2 = 2e^4\left[\frac{pk'}{pk} + \frac{pk}{pk'} + 2m^2\left(\frac{1}{pk} - \frac{1}{pk'}\right) + m^4\left(\frac{1}{pk} - \frac{1}{pk'}\right)^2\right]$$

they go to formula 5.91:

$$\frac{d\sigma}{d\cos\theta} = \frac{\pi\alpha^2}{m^2}\left(\frac{\omega'}{\omega}\right)^2\left[\frac{\omega'}{\omega} + \frac{\omega}{\omega'} - \sin^2\theta\right].$$

From that step it seems to me that $2m^2\left(\frac{1}{pk} - \frac{1}{pk'}\right) + m^4\left(\frac{1}{pk} - \frac{1}{pk'}\right)^2$ is somehow eqvivalent to $-\sin^2\theta$.

I saw in other books and there $-\sin^2\theta$ is related to sum over photon polarizations...so if in Peskin Schroeder

from $2m^2\left(\frac{1}{pk} - \frac{1}{pk'}\right) + m^4\left(\frac{1}{pk} - \frac{1}{pk'}\right)^2$ they go to $-\sin^2\theta$ does it mean that $2m^2\left(\frac{1}{pk} - \frac{1}{pk'}\right) + m^4\left(\frac{1}{pk} - \frac{1}{pk'}\right)^2$ is related to this photon polarization?

I don't understnad why exactly $2m^2\left(\frac{1}{pk} - \frac{1}{pk'}\right) + m^4\left(\frac{1}{pk} - \frac{1}{pk'}\right)^2$ expression has been rewritten into $-\sin^2\theta$?