$$\begin{cases} \left\langle \cos^2(x) \right\rangle = \dfrac{1}{2\pi} \displaystyle\int_0^{2\pi} \cos^2(t) dt = \dfrac{1}{2} \\ \left\langle \sin^2(x) \right\rangle = \dfrac{1}{2\pi} \displaystyle\int_0^{2\pi} \sin^2(t) dt = \dfrac{1}{2} \end{cases}$$