*solve the functional equation*: $f(\sqrt{x^2+y^2})=f(x)f(y)$
*solution*:

$$f(x)=f(\sqrt{(\frac{x}{\sqrt{2}})^2+(\frac{x}{\sqrt{2}})^2})=f(\frac{x}{\sqrt{2}})^2$$

*repeating we obtain*

$$[f(x)]^{(\frac{1}{2^n})}=f(\frac{x}{2^{(\sum_{k=1}^{n}(\frac{1}{2^k}))}})$$

*at n tends* $\infty$

$$1=f(\frac{x}{2})$$

*therefore* $f(x)=1$ *is a solution*