$$e^{ix} = \cos x + i \sin x \qquad \text{\# Euler's formula}$$
$$\Rightarrow \quad e^{i\frac{\pi}{2}} = \cos \tfrac{\pi}{2} + i \sin \tfrac{\pi}{2} \qquad \text{\# set } x = \tfrac{\pi}{2}$$
$$\Rightarrow \quad e^{i\frac{\pi}{2}} = 0 + i \cdot 1 \qquad \text{\# trig}$$
$$\Rightarrow \quad e^{i\frac{\pi}{2}} = i \qquad \text{\# simplify}$$
$$\Rightarrow \quad (e^{i\frac{\pi}{2}})^i = i^i \qquad \text{\# raise both sides to } i$$
$$\Rightarrow \quad e^{\frac{i^2 \pi}{2}} = i^i \qquad \text{\# } (x^m)^n = x^{mn}$$
$$\Rightarrow \quad e^{-\frac{\pi}{2}} = i^i \qquad \text{\# } i^2 = -1$$
$$\Rightarrow \quad e^{-\frac{\pi}{2}} \text{ is real} \Rightarrow i^i \text{ is a real number}$$