Demostrar que $\forall x \in \mathbb{R}$

$$\cos(\sin x) > \sin(\cos x)$$

$$f(x) = \cos(\sin x) - \sin(\cos x) > 0$$

$\Rightarrow$ ① $\cos(\sin x) \neq \sin(\cos x)$

② $x = 0 \to 1 - \sin 1 > 0$!!

$$\cos(\sin x) = \sin(\cos x)$$

$\pi/2$

	0	$\pi/2$	π	$3\pi/2$	2π
s	0	1	0	-1	0
c	1	0	-1	0	1

$$\boxed{\cos(x) = \operatorname{sen}\left(x + \frac{\pi}{2}\right)}$$

$$\operatorname{sen}\left(|\operatorname{sen} x| + \frac{\pi}{2}\right) = \operatorname{sen}(\cos x)$$

$$k \in \mathbb{N}_0$$

$$\operatorname{sen} x + \frac{\pi}{2} = \cos x \pm 2k\pi$$

$$\operatorname{sen} x + \frac{\pi}{2} \mp 2k\pi = \cos x$$

$$\left[\operatorname{sen}^2 x + \cos^2 x = 1 \rightarrow \cos x = \pm\sqrt{1-\operatorname{sen}^2 x}\right.$$

$$\operatorname{sen} x + \pi\left(\frac{1 \mp 4k}{2}\right) = \pm\sqrt{1-\operatorname{sen}^2 x}$$

$$\boxed{t = \operatorname{sen} x}$$

$$\left(t + \pi\left(\frac{1 \mp 4k}{2}\right)\right)^2 = \left(\pm\sqrt{1-t^2}\right)^2$$

$$\cancel{t^2} + \pi^2\frac{(1 \mp 4k)^2}{4} + \cancel{2}t\pi\left(\frac{1 \mp 4k}{\cancel{2}}\right) = 1 - \cancel{t^2}$$

$$2t^2 + n(1 \mp 4k)n + \frac{n^2}{4}(1 \mp 4k)^2 - 1 = 0.$$

$$\Delta = n^2(1 \mp 4k)^2 - 2n^2(1 \mp 4k)^2 + 8 =$$

$$= -n^2(1 \mp 4k)^2 + 8 < -9 + 8 = -1 < 0$$

$\forall x\ \mathbb{R} \quad \cos(\operatorname{sen} x) \neq \operatorname{sen}(\cos x)$

$x = 0 \quad \cos(0) = 1 > \operatorname{sen}(1)$

$\operatorname{sen}(\cos x)$, $\cos(\operatorname{sen} x)$ continuas

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$\forall x \in \mathbb{R}, \quad \cos(\operatorname{sen} x) > \operatorname{sen}(\cos x)$