

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos(x + \cos x)}{\sin x} = | \text{the limit of quotient} | =$$

$$= \frac{\lim_{x \rightarrow \frac{\pi}{2}} \cos(x + \cos x)}{\lim_{x \rightarrow \frac{\pi}{2}} \sin x}$$

= | functions $\sin x$ and $\cos x$ are continuous, we also use the limit of the sum of functions | =

$$= \frac{\cos\left(\frac{\pi}{2} + 0\right)}{\sin\left(\frac{\pi}{2}\right)} = \frac{0}{1} = 0$$