(26) $\lim_{x \to 1} \tan\left(\frac{\pi x}{2}\right) \ln x \quad \infty \cdot 0$

$$\frac{\ln x}{\cot\left(\frac{\pi x}{2}\right)} \quad \frac{0}{0}$$

$$\xrightarrow{LR} \frac{\frac{1}{x}}{-\csc^2\left(\frac{\pi x}{2}\right) \cdot \frac{\pi}{2}} = \frac{1}{\frac{\pi}{2} \cdot (-1)} = -\frac{2}{\pi}$$

OR rewrite as $\dfrac{\tan\left(\frac{\pi x}{2}\right)}{\frac{1}{\ln x}} \xrightarrow{LR} \dfrac{\sec^2\left(\frac{\pi x}{2}\right) \cdot \frac{\pi}{2}}{\frac{\ln x \cdot (0) - 1 \cdot \frac{1}{x}}{(\ln x)^2}}$

$$= \frac{\frac{\pi}{2} \sec^2\left(\frac{\pi x}{2}\right)}{\frac{-1}{x (\ln x)^2}} +$$

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(29) $\lim_{x \to 1} \dfrac{x\left[(\ln x) - 1\right] + 1}{(x-1)\ln x}$ $\dfrac{0}{0}$

$$\frac{x\ln x - x + 1}{x\ln x - \ln x} \xrightarrow{LR} \frac{x\cdot\frac{1}{x} + 1\cdot\ln x - 1}{x\cdot\frac{1}{x} + \ln x - \frac{1}{x}}$$

$$\frac{\ln x}{1 + \ln x - \frac{1}{x}} \quad \frac{0}{0} \xrightarrow{LR} \frac{\frac{1}{x}}{\frac{1}{x} + \frac{1}{x^2}} = \frac{1}{1+1} = \frac{1}{2}$$

(33) $\lim_{x \to 0} \dfrac{\sin x - x\cos x}{x - \sin x}$ $\dfrac{0}{0}$

$\xrightarrow{LR}$ $\dfrac{\cos x - (\cos x - x\sin x)}{1 - \cos x}$

$\dfrac{x\sin x}{1-\cos x}$ $\dfrac{0}{0}$ $\xrightarrow{LR}$ $\dfrac{\sin x + x\cos x}{\sin x}$ $\dfrac{0}{0}$

$\xrightarrow{LR}$ $\dfrac{\cos x + (\cos x - x\sin x)}{\cos x} = \dfrac{2\cos x - x\sin x}{\cos x}$

$= 2$