

$$\textcircled{5} \quad \lim_{x \rightarrow 1} (1-x) \tan \frac{\pi x}{2}$$

$$\text{Put } x-1 = y$$

$$\therefore = \lim_{y \rightarrow 0} y \tan \frac{\pi}{2} (y+1)$$

$$= - \lim_{y \rightarrow 0} y \left[- \cot \left(\frac{\pi}{2} y \right) \right]$$

$$= \lim_{y \rightarrow 0} \left(\frac{y \cdot \frac{\pi}{2}}{\tan \frac{\pi}{2} y} \right) \cdot \frac{2}{\pi}$$

$$= \frac{2}{\pi}$$