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$$g(x) = f(\tan^2 x + \sqrt{2} \cos x) \rightarrow g'(x) = \underbrace{2 \tan x (1 + \tan^2 x)}_u - \sqrt{2} \sin x \cdot \underbrace{f'(\tan^2 x + \sqrt{2} \cos x)}_{f'(v)} \quad (1)$$

$$x = \frac{\pi}{4} \rightarrow g'(\frac{\pi}{4}) = \sqrt{2} = 2 f'(v) \rightarrow f'(v) = \frac{\sqrt{2}}{2}$$

$$\begin{aligned} \rightarrow f(x) &= \frac{\cos^2 x - 2 \cos x + 2}{2 - \cos x} \\ g(x) &= \frac{2}{2 - \cos x} \end{aligned} \left\{ \begin{aligned} \Rightarrow (f - 2g)(x) &= \frac{\cos^2 x - 2 \cos x}{2 - \cos x} \\ &= \frac{-\cos x (2 - \cos x)}{2 - \cos x} = -\cos x \end{aligned} \right. \quad (2)$$

$$\rightarrow (f - 2g)'(x) = \sin x \xrightarrow{x = \frac{\pi}{4}} = \sin \frac{\pi}{4} = \frac{1}{\sqrt{2}} \quad (3)$$

$$\begin{aligned} \rightarrow y &= -ax + 2 \xrightarrow{x=r} (r, 2-ra) \in f \\ \hookrightarrow y' &= -a \end{aligned} \rightarrow f(r) + f'(r) = 2 - ra - a = -1 \rightarrow 2a = 2$$

$$\left. \begin{aligned} f'(r) &= -a = -\frac{2}{\delta} \\ a &= \frac{2}{\delta} \end{aligned} \right\} \quad (4)$$

$$\rightarrow \frac{ax - 1}{2x + 1} = \frac{x + \delta}{\sqrt{2}} \rightarrow \sqrt{2}ax - \sqrt{2} = 2x + 1 + \delta x + \delta \rightarrow \sqrt{2}x^2 + (\sqrt{2} - \delta)x + 1 - \delta = 0$$

$$\rightarrow \frac{a + \sqrt{2}}{(2x + 1)^2} = \frac{1}{\sqrt{2}} \rightarrow \sqrt{2}a + \sqrt{2} = 2x^2 + 4x + 1$$

$$(1, 0) \rightarrow 1a - b + 1 = 0 \rightarrow b - 1a = 1 \rightarrow (b = -19) \quad (9)$$

$$\rightarrow 1x^1 + a = f'(x) \xrightarrow{x=1} f'(1) = 0 = 1 + a \rightarrow a = -1 \quad (10)$$

$$\rightarrow b - a = -19 \quad (11)$$

$$\rightarrow f'(x) = n \sin^{n-1}(x^1) \times \cos x^1 \times 1x \quad (12)$$

$$\lim_{x \rightarrow 0} \frac{f(x) \cdot f'(x)}{(1 - \cos x)^m} = \frac{1 \cdot 1}{(1 - \cos x)^m} = \frac{\sin^n(x^1) \cdot n \sin^{n-1}(x^1) \times \cos x^1 \times 1x}{(1 - \cos x)^m}$$

$$f(x) : \left| \begin{matrix} 1 \\ 1 \end{matrix} \right| \rightarrow f(x) : \left| \begin{matrix} 1 \\ 1 \end{matrix} \right| \rightarrow \frac{\sqrt{x}+1}{\sqrt{x}-1} = 1 \rightarrow \sqrt{x} = 1 \rightarrow x = 1 \quad (13)$$

$$f'(x) = \frac{\frac{1}{\sqrt{x}}(\sqrt{x}-1) - \frac{1}{\sqrt{x}}(\sqrt{x}+1)}{(\sqrt{x}-1)^2} \xrightarrow{x=1} \frac{\frac{1}{1} \times 1 - \frac{1}{1} \times 1}{2} = \frac{-1}{1} = -1 \quad (14)$$

$$m^{-1} = -1 \quad (15)$$

$$\begin{aligned} x=0 &\rightarrow f(x)=1 \\ x=-1 &\rightarrow f(x)=1 \end{aligned} \quad \left\{ \begin{aligned} &1(1-0) \\ &1(1-1) \end{aligned} \right\} \quad \begin{aligned} &11 = 1a - 1 \rightarrow a = -1 \end{aligned} \quad (16)$$

$$x=1 \rightarrow f'(x) = 1(x+1)^1 \times 1x + \frac{1}{1}(x+1)^1 = 1 \quad (17)$$

$$y = \sin x \cos x : \frac{-1}{\frac{1}{1}} = -1 \quad (18)$$

$$f = \sin^1 x \cos^1 x = \cos^1 x \rightarrow \frac{1}{\frac{1}{1}} = 1 \quad (19)$$