

(۳,۵)

$$\left. \begin{aligned} f(3) &= 0 \\ f'(3) &= \frac{\varepsilon}{3} \end{aligned} \right\}$$

$$y = ax + b$$

$$b = 1$$

$$0 = 3a + 1$$

$$\varepsilon = 3a \quad a = \frac{\varepsilon}{3}$$

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$$ax + b \rightarrow a = \frac{3-1}{3+1} = \frac{1}{4} \quad b = \frac{\varepsilon}{3} \quad y = -\frac{1}{4}x + \frac{\varepsilon}{3}$$

$$\varepsilon - x = 3\sqrt{ax-1} \quad \rightarrow \quad -\frac{1}{3} = \frac{a}{3\sqrt{ax-1}} \quad \rightarrow \quad x^2 + (A-9a)x + 20 = 0$$

$$(A-9a)^2 = 100 \quad \rightarrow \quad a = 2 \quad \rightarrow \quad \boxed{f(2) = 3}$$

۲

$$m = \frac{3}{2} \implies y' = \frac{(2x+m)(n+3) - (x^2+mx+1)(n+3)}{(n+3)^2} = \frac{x^2 + 4x + 2m - 1}{(n+3)^2}$$

$$\xrightarrow{x=1} \frac{4+2m}{14} = \frac{3}{2} \implies m = 2 \quad n = 1 \quad \rightarrow \quad \boxed{m+n=3}$$

۲

$$g'(x) = \frac{-3\cos x}{(3+\sin x)^2} \quad f'(x) = \frac{\cos - 9\cos}{(\sin x + 3)^2}$$

$$\implies 3g'\left(\frac{5\pi}{3}\right) - f'\left(\frac{5\pi}{3}\right) = \left\{ \frac{-4\sqrt{3} + 3\sqrt{3}}{12} \right\}$$

۱,۵

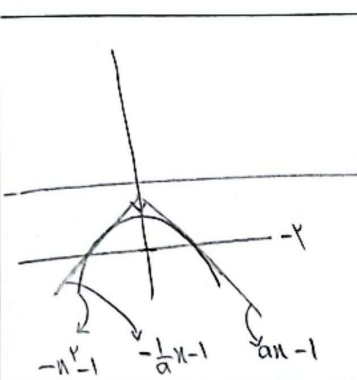
$$g' \times f'(g) = (f \circ g)' \implies f \circ g = -\frac{1}{\sqrt{\frac{1}{x^0+1x^0} + \left| \frac{1}{x^0+1x^0} \right|}} = -x$$

$$(f \circ g)' = \boxed{-1}$$

۵

$$f(x) = \left( \frac{\sin x - 1}{\sin x + 1} \right)^y = x g(x) + 1 \longrightarrow g(x) = \frac{\left( \frac{\sin x - 1}{\sin x + 1} \right)^y - 1}{x}$$

$$\lim_{x \rightarrow 0} g(x) = \lim_{x \rightarrow 0} \frac{\left( \frac{\sin x - 1}{\sin x + 1} \right)^y - 1}{x} \xrightarrow{\text{L'Hôpital}} = \frac{y \left( \frac{\sin x - 1}{\sin x + 1} \right)^{y-1} \left( \frac{\cos x}{\sin x + 1} \right)^y}{1} = \boxed{-\varepsilon}$$



$$an - 1 = -n^y - 1 \quad , \quad -\frac{1}{a}n - 1 = -n^y - 1$$

$$a = 1 \quad n - 1 \quad , \quad -n - 1$$

$$n - 1 = -n^y - 1 \quad x = -n^y \longrightarrow x = -1$$

$$-n - 1 = -n^y - 1 \quad n = n^y \longrightarrow n = +1$$

$$-n^y - 1 \longrightarrow (n=1) \longrightarrow y = -y \quad \left. \begin{array}{l} \text{بسیار زیاده} \\ \text{پ} \end{array} \right\}$$

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دکتر  $\rightarrow an - b$  بسیار زیاده,  $b=0$  بسیار زیاده  $\rightarrow f(x) = ax$ ,  $f'(x) = a$

$$y\sqrt{x} (\varepsilon n^y + y) = ax \longrightarrow \left( \frac{1}{\sqrt{x}} \right) (\varepsilon n^y + y) + (y\sqrt{x})(1/x) = a = \frac{y \cdot x^y + y}{\sqrt{x}}$$

$$(y\sqrt{x})(\varepsilon n^y + y) = x \times \frac{y \cdot x^y + y}{\sqrt{x}} \longrightarrow \Lambda n^y + y = y \cdot x^y + y \longrightarrow \Lambda n^y - y = 0$$

$$x = \left\{ \begin{array}{l} + \frac{1}{y} \\ - \frac{1}{y} \end{array} \right\} \text{XGGG} \quad \left. \begin{array}{l} a = \Lambda \sqrt{y} \\ \checkmark \end{array} \right\}$$

$an + b$  بسیار زیاده,  $b=0$  بسیار زیاده  $\rightarrow f(x) = ax$ ,  $f'(x) = a$

$$\frac{\sqrt{x}}{-2n^y + x + 1} = ax \quad , \quad a = \frac{4n^y - n + 1}{(y\sqrt{x})(-2n^y + x + 1)^y}$$

$$A = f\left(\frac{1}{y}\right) = \left\{ \frac{\sqrt{y}}{y} \right\}$$

$$\frac{\sqrt{x}}{-2n^y + x + 1} = \left( \frac{x}{y\sqrt{x}} \right) \left( \frac{4n^y - n + 1}{(-2n^y + x + 1)^y} \right) \longrightarrow 4n^y - n + 1 = -\varepsilon n^y + 2n + y \Rightarrow x < \frac{1}{y} \sqrt{\quad}$$

$-\frac{1}{8} \text{XGGG}$

$$f(x) = (x \varepsilon x)^y, \quad g(x) = \frac{1}{\sqrt{x^y - 1}} \longrightarrow f \circ g(x) = \left( \left( \frac{1}{\sqrt{x^y - 1}} \right) \left( \frac{1}{\sqrt{x^y - 1}} \right) \right)^y$$

$$\text{ساده} \rightarrow (f \circ g)'(x) = g'(x) \times f'(g(x)) = \frac{y \sqrt{x^y - 1}^y}{x} \times y x \frac{y \sqrt{x^y - 1}^y}{x} = \frac{y^2 \sqrt{x^y - 1}^y}{x^2}$$

$$= \frac{y^2 \times (n^y - 1)^y}{n^y} = y^2 \times \frac{1}{0} \times \frac{1}{1^y} = y^2 \times \frac{1}{0} \times \frac{1}{1^y} = \left\{ \frac{y}{0} \right\} \frac{y}{0} = \frac{y}{-5\sqrt{1/8}}$$

$$\frac{y}{0 \times \sqrt{0} \times -\varepsilon x} = \frac{1}{-\varepsilon \cdot \sqrt{0}} = \left\{ \frac{\sqrt{0}}{-y \cdot 0} \right\}$$

$$u g - \psi(n) = \frac{9}{u + \sin n} - \frac{(u - \sin n)(9 + \sin^2 n + u \sin n)}{(u - \sin n)(u + \sin n)} = \frac{-\sin n(\sin n + u)}{\sin n + u}$$

$$\hookrightarrow -\sin n \xrightarrow{\text{مشتق}} (u g - \psi)'(n) = -C \cdot \sin \leadsto -\cos\left(\frac{\Delta n}{r}\right) = -\frac{1}{r}$$

$$y = u^2 - 1 \xrightarrow{\text{تقریب}} y_1 = -x^2 - 1 \xrightarrow{\text{مشتق}} y'_1 = -2x$$

$$m_{Q_1} = -2(-\alpha) = 2\alpha$$

$$m_{Q_2} = -2(\alpha) = -2\alpha$$

$$\xrightarrow{\text{عمود}} -2\alpha^2 = -1 \leadsto \alpha = \pm \frac{1}{\sqrt{2}}$$

۲ خط را اول و ۲ در نظر بگیرید:

$$\text{نقطه} \rightarrow A\left(-\frac{1}{\sqrt{2}}, \beta\right) \quad B\left(\frac{1}{\sqrt{2}}, \beta\right) \xrightarrow{\text{فاصله خط از مبدأ}} \left| -\left(-\frac{1}{\sqrt{2}}\right)^2 - 1 \right| = \left| -\frac{1}{2} - 1 \right| = \frac{3}{2}$$

$$g(x) = (x^2 - 1)^{-\frac{1}{r}} \rightarrow g'(x) = -\frac{1}{r} (2x) (x^2 - 1)^{-\frac{r}{r}}$$

$$g'\left(\sqrt{\frac{\Delta}{r}}\right) = -\frac{1}{r} (\sqrt{\Delta}) \left(\frac{\Delta}{r} - 1\right)^{-\frac{r}{r}} \rightarrow -\frac{\sqrt{\Delta}}{r} \left(\frac{-r}{r}\right) = -\sqrt{\Delta}$$

$$g\left(\sqrt{\frac{\Delta}{r}}\right) = \frac{1}{\sqrt{\frac{\Delta}{r} - 1}} = \frac{1}{\sqrt{\frac{1}{r} - 1}} = \frac{1}{\frac{1}{r} - 1} = r^+$$

$$f'(r^+) = ((2x)^r)' = r \cdot 2x^{r-1} = r \cdot 2x \cdot \varepsilon$$

$$f \circ g'\left(\sqrt{\frac{\Delta}{r}}\right) = -\sqrt{\Delta} \times r \cdot 2x \cdot \varepsilon \xrightarrow{\text{:-}\sqrt{\Delta}} \frac{r \cdot 2x \cdot \varepsilon - \sqrt{\Delta}}{-\sqrt{\Delta}} = \boxed{1}$$