

$$g'(m) = \left( 2(1 + \tan^2 m) (\tan m) + \sqrt{2} \sin m \right) \times f'(\tan^2 m + \sqrt{2} \cos m)$$

$$g'\left(\frac{\pi}{4}\right) = \sqrt{2} = (2 - \sqrt{2}\left(\frac{\sqrt{2}}{2}\right)) \times f'(1+1) \Rightarrow \sqrt{2} = 2 f'(2) \quad (2)$$

$$\checkmark \quad \frac{\sqrt{2}}{2} = f'(2)$$

$$f(m) = 2(g(m)) = \frac{(2 \cos m)(2 - 2 \cos m + \cos^2 m)}{(2 + \cos m)(2 - \cos m)} = \frac{4}{2 - \cos m} = \frac{4 - 2 \cos m + \cos^2 m}{2 - \cos m}$$

$$\rightarrow f(m) - 2(g(m)) = (-\cos m) \sin m \rightarrow \sin\left(\frac{\sqrt{2}\pi}{4}\right) = \frac{-1}{2} = -\cos 2\pi \quad (2)$$

$$f(x) = |x - 2| \sqrt{ax} \quad x = \frac{4}{9}$$

$$- \pm (x - 2) \sqrt{ax} \xrightarrow{\text{مشتق}} \pm (x) (\sqrt{ax}) \pm \frac{a}{2\sqrt{ax}} (x - 2)$$

$$\frac{x\sqrt{ax}}{x} + \left(-\frac{x\sqrt{ax}}{x}\right) = 2\sqrt{4} \rightarrow \frac{x\sqrt{4a}}{x} = x\sqrt{4}$$

$$\frac{x(xa)}{x} = 4x \rightarrow a = \frac{1}{x} \quad \checkmark$$

$$y + ax = 2 \rightarrow y = 2 - ax \quad f'(x) = -a \quad f(x) = 2 - ax$$

$$f(x) + f'(x) = -1 \Rightarrow 2 - ax + (-a) = -1$$

$$-ax = -2 \rightarrow a = \frac{2}{a} \quad (2)$$

$$\boxed{f'(x) = -\frac{2}{a}} \quad \checkmark$$

$$Vy = a + x \rightarrow y = \frac{a+x}{v} \quad y = \frac{am-1}{3m+1}$$

$$\frac{1}{v} = \frac{a+x}{(3m+1)^2} \rightarrow 4m^2 + 1 + 4m, \quad \forall a \neq 21$$

$$\frac{am-1}{3m+1} = \frac{a+x}{v} \rightarrow 4m^2 + m(14-4a)m + 12m$$

$$\Delta = 0 \rightarrow (14-4a)^2 = 144$$

$$\boxed{a = 5}$$

$$14 - 4a = -12 \quad a = 5$$

$$a = 5 \quad m = 1 \quad \checkmark$$

$$f(x) = x^r + ax - b \quad \vee \quad f(r) = 0$$

$$f'(x) = rx + a \rightarrow 0, \quad r(r) + a$$

$$1 + r(-1) - b = 0$$

$$1 - r - b = 0 \rightarrow b = -14$$

$$-14 + 1r - \varepsilon$$

$$\lim_{n \rightarrow \infty} \frac{x^{r_n} x^{r_{n+1}} x^{r_{n+2}}}{\left(\frac{x^r}{r}\right)^n} = \lim_{n \rightarrow \infty} n x^{r^{n+1}} x \frac{x^{r_{n+1}-1}}{n r^n} = r r^{\frac{1}{r}}$$

$$r_{n+1} = r_m \quad n x^{r^{n+1}} = r r^{\frac{1}{r}}$$

$$n = r \quad m = \frac{r}{r}$$

$$r_{m+n} = r\left(\frac{r}{r}\right) + r = 4$$

$$f(x) = \frac{\sqrt{x} + 1}{\sqrt{x} - 1}$$

$$f'(x) = \frac{\sqrt{x}-1}{2\sqrt{x}} - \frac{\sqrt{x}+1}{2\sqrt{x}}$$

$$= \frac{-x}{x\sqrt{x}} = \frac{-1}{\sqrt{x}(\sqrt{x}+1-\sqrt{x})}$$

$$f(x) = \frac{\sqrt{x}+1}{\sqrt{x}-1} \rightarrow \sqrt{x}y - y = \sqrt{x} + 1 \rightarrow \sqrt{x}(y-1) = y+1 \rightarrow \sqrt{x} = \frac{y+1}{y-1} \rightarrow x = \left(\frac{y+1}{y-1}\right)^2 \rightarrow y = \left(\frac{x+1}{x-1}\right)^{\frac{1}{2}}$$

$$f'(x) = \left(\frac{x+1}{x-1}\right)^{-\frac{1}{2}} \rightarrow (f')' = r\left(\frac{x+1}{x-1}\right)^{-\frac{r}{2}} x^{-\frac{r}{2}} = \frac{-1}{2\sqrt{x-1}} \quad (f'(r))' = r x^{\frac{1}{2}}(-r) = -1r$$

$$[-1, 0] \rightarrow -1: 1 - \lambda(-a+1) \rightarrow \frac{1 - \lambda(-a+1)}{1} = -1 \rightarrow 1 - \lambda(-a+1) = -1$$

$$f(x) = (x^r+1)^r \left(-\frac{1}{r}x+1\right) \quad f'(x) = \left(-\frac{1}{r}\right)(x^r+1)^r + r(x^r+1)^{r-1} \left(-\frac{1}{r}x+1\right)$$

$$\left(-\frac{1}{r}\right)(1) + r(x)(\varepsilon)\left(\frac{1}{r}\right) = 1r - \varepsilon = 1 \quad x = -ra \pm 1 \quad a = -0.0$$

$$y = \sin x \cos x \rightarrow \frac{\pi}{r} : |x-1| = -1$$

$$\rightarrow \frac{\pi}{\varepsilon} \rightarrow \frac{\sqrt{r}}{r} x^0 = 0$$

$$y = \sin x - \cos x = -\cos x \rightarrow \frac{\pi}{r} \rightarrow 1$$

$$\rightarrow \frac{\pi}{\varepsilon} \rightarrow 0$$

$$\frac{-1-0}{1-0} = -1$$