

$$1) g'(\frac{\pi}{4}) = (2 \times \tan \frac{\pi}{4} \times \frac{1}{\cos^2 \frac{\pi}{4}} + (-\sqrt{2} \sin \frac{\pi}{4}) \times f'(2)) = \sqrt{3}$$

$$= 3f'(2) = \sqrt{3} \Rightarrow f'(2) = \frac{\sqrt{3}}{3}$$

مشتق های استغلا شده:

$$\cos(u) = -u' \times \sin u$$

$$\tan(u) = \sec(u) \times u'$$

$$1) f(x) = \frac{(\cos x + 2)(\cos^2 x + 5 - 2\cos x)}{(2 - \cos x)(2 + \cos x)} = \cos x - 2 \xrightarrow{f'(x)} -\sin x$$

$$2) g'(x) = -\frac{2 \sin x}{(\cos x - 2)^2}$$

$$3) f'(\frac{\sqrt{x}}{2}) - 2g'(\frac{\sqrt{x}}{2}) = \frac{-\sin \frac{\sqrt{x}}{2} + 2 \sin \frac{\sqrt{x}}{2}}{(\cos \frac{\sqrt{x}}{2} - 2)^2} = \frac{2(1 + \sqrt{3})}{2}$$

$$1) f_+'(\frac{\sqrt{a}}{2}) = (f(x) - 2) \sqrt{a} = f \sqrt{a} + 0 = f \sqrt{\frac{a}{2}}$$

$$2) f_-'(\frac{\sqrt{a}}{2}) = (2 - f(x)) \sqrt{a} = -f \sqrt{a} + 0 = -f \sqrt{\frac{a}{2}}$$

$$3) \sqrt{\frac{a}{2}} = 2\sqrt{2} \quad \sqrt{2} = \sqrt{\frac{a}{2}} \rightarrow a = 8 \quad \boxed{a=8}$$

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

$$-ax = -3 \quad a = \frac{3}{\omega}$$

$$2) f'(x) = -a = -\frac{3}{\omega}$$

$$1) \frac{a(n-1)}{n+1} = \frac{n+a}{2} \rightarrow 2an - 2 = n^2 + 1 + an + a$$

$$2) \frac{a(n-1)}{n+1} = \frac{n+a}{2} \rightarrow 2an - 2 = n^2 + 1 + an + a$$

$$3) 2n^2 + (4-2a)n + 1 = 0$$

$$9n^2 + 6na + 1 = 0$$

چون نقطه تلاقی باید متافعال باشد $\rightarrow 3(n-2)^2 \Rightarrow -2a + 12 = -12 \Rightarrow a = 12$

① مشتق
n=2
مقراسه

$$\Rightarrow 3n^2 + a = 0 \rightarrow 3x(F) + a = 0 \rightarrow a = -12$$

-16

$$f(x) = 9 \Rightarrow 1 - 12(F) - b = 0 \quad b = -16$$

$$b - a = -16 + 12 = -4$$

6



7

$$\frac{\sqrt{n} + 1}{\sqrt{n} - 1} = 2 \rightarrow 2\sqrt{n} - 2 = \sqrt{n} + 1 \rightarrow \sqrt{n} = 3 \Rightarrow n = 9$$

$$f'(9) = \frac{\frac{1}{x^3} (3-1) - (f) \times \frac{1}{x^3}}{f} = \frac{\frac{1}{3} - \frac{2}{3}}{\frac{1}{3}} = -\frac{1}{12}$$

$$-12$$

8

$$\frac{f(0) - f(-1)}{0 - (-1)} = 1a - 1 = -11 \Rightarrow a = -10$$

9

$$f'(n) = 3 \times n \times (n^2 + 1)^2 \times (-\frac{2}{n^3} + 1) - \frac{1}{n^3} (n^2 + 1)^3 \Rightarrow f'(1) = 1$$

~~$$y' = \cos nx (\cos nx + \sin nx) + \sin nx (\cos nx - \sin nx) = \cos^2 nx - \sin^2 nx = \cos 2nx$$~~

~~$$y' = 2 \sin x \cos x = \sin 2x$$~~

~~$$\frac{1}{x} \times \frac{1}{x} = \frac{1}{x^2}$$~~

$$\frac{f(\frac{\pi}{2}) - f(\frac{\pi}{2})}{\frac{\pi}{2} - \frac{\pi}{2}} = \frac{-1}{\frac{\pi}{2}} = -\frac{2}{\pi}$$

$$\frac{f}{x} = -1$$

$$\frac{f(\frac{\pi}{2}) - f(-\frac{\pi}{2})}{\frac{\pi}{2} - (-\frac{\pi}{2})} \xrightarrow{y' = -\cos x} \frac{1}{\pi} = \frac{1}{\pi}$$