

$$f(x) = \begin{cases} a + \sqrt{x} & ; x < 1 \\ b\sqrt{x} & ; x \geq 1 \end{cases}$$

دو از هم مساوی

مریم نیکولی

(سوال 1)

$$a+b=5$$

$$a+|x| \Rightarrow x=0$$

مشتق

$$R \text{ در } x=1 \rightarrow x=1 \left\{ \begin{matrix} a+1 \\ b \end{matrix} \right\} \rightarrow a+1=b \Rightarrow a=\frac{1}{p}$$

$$\Rightarrow a+b = \frac{1}{p} + \frac{p}{p} = \boxed{2}$$

$$\text{در } x=1 \rightarrow \frac{a}{\sqrt{x}} \rightarrow 1$$

مشتق

$$\frac{2b}{\sqrt{x}} \rightarrow \frac{2b}{\sqrt{x}} \rightarrow \frac{2b}{\sqrt{x}} = 1 \rightarrow b = \frac{p}{2}$$

$$f(x) = \frac{|x-2|}{\sqrt{x}} \quad g(x) = \frac{\sqrt{x^2-5x+6} + \sqrt{x}}{\sqrt{x}}$$

(سوال 2)

$$f'(1) - 2g'(1) = ? \rightarrow (f-2g)'(1)$$

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

$$\rightarrow f(x) - 2g(x) = \frac{-(x-2)}{\sqrt{x}} + \frac{2(x-2) - 2\sqrt{x}}{\sqrt{x}} \Rightarrow \frac{-2\sqrt{x}}{\sqrt{x}}$$

$$\Rightarrow -2\sqrt{x} x^{-\frac{1}{2}} \xrightarrow{\text{مشتق}} -2\sqrt{x} \left(-\frac{1}{2}\right) x^{-\frac{3}{2}} \Rightarrow x=1 \rightarrow -2\sqrt{x} \left(-\frac{1}{2}\right) (1) = \boxed{\frac{\sqrt{x}}{2}}$$

آپادانا

$$f(n) = \begin{cases} bn+c & n < a \\ \frac{1}{n} & n > a \end{cases} \quad ac=5 \quad (\text{سوال ۳})$$

! Cmo parir gait 1 Bco, 1 p qat

$$n=a \begin{cases} ab+c \\ \frac{1}{a} \end{cases} \rightarrow ab+c = \frac{1}{a} \rightarrow -\frac{1}{a} + c = \frac{1}{a} \rightarrow c = \frac{2}{a}$$

$$f'(n) = \begin{cases} b & n < a \\ -\frac{1}{n^2} & n > a \end{cases} \rightarrow n=a \begin{cases} b \\ -\frac{1}{a^2} \end{cases} \rightarrow b = -\frac{1}{a^2}$$

$$ac = \frac{2}{a} \times a = \boxed{2}$$

$$f(n) = \begin{cases} b & n < a \\ b + (n-a)^m & n > a \end{cases} \quad (\text{سوال ۴})$$

$$\lim_{n \rightarrow a} f(n) \rightarrow b = b$$

$$\text{چون } 0 \neq m(n-a)^{m-1} \rightarrow n=a \rightarrow 0 \neq 0 \times$$

$$\rightarrow m-1=0 \rightarrow m=1 \quad (\text{Cmo m gait 1})$$

$$\rightarrow 1 \neq 0 \checkmark$$

$$f(n) = \frac{1}{\sqrt[n]{n-1}} \quad g(n) = \frac{1}{n^2 - \ln^2} \quad (\text{سوال ۵})$$

$(f \circ g)(-\sqrt{e})$ ← Cmo gait 1

$$\rightarrow f(n) = \frac{1}{\sqrt[n]{n}} \quad g(n) = \frac{1}{n^2} \rightarrow f \circ g(n) = \frac{1}{\sqrt[n]{\frac{1}{n^2}}} \rightarrow f \circ g(n) = n^{\frac{2}{n}}$$

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

آپادانا

$$y = -a - \omega \quad f'(x) - f(x) = 1$$

(4 سوال)

$$f(x) = -x a - \omega \quad f'(x) = -a \rightarrow f(x) = -0.5, f'(x) = 1.5$$

$$\rightarrow -a - (-x a - \omega) = 1 \Rightarrow -a + x a + \omega = 1 \Rightarrow x a = -1 \rightarrow a = -1.5$$

$$\frac{f(x)}{f'(x)} = \frac{-0.5}{1.5} = \boxed{-\frac{1}{3}}$$

$$f(x) = \left(x \left[x^r + \frac{1}{r}\right]\right)^r + 1 \quad g(x) = \frac{1}{\sqrt[r]{x^r - 1}}$$

(10 سوال)

$$(f \circ g)'(x) = g'(x) \times f'(g(x))$$

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

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

$$g\left(\frac{r}{\sqrt{r}}\right) = \frac{1}{\sqrt[r]{\frac{1}{r}}} = \frac{r}{r}$$

$$f'(x) \Rightarrow x \rightarrow r \rightarrow x^r \rightarrow r \rightarrow \left[x^r + \frac{1}{r}\right] = r$$

$$\rightarrow f(x) = (x)^r \rightarrow 14x^r \rightarrow f'(x) = r x^{r-1} \rightarrow f'(r) = 4r$$

$$(f \circ g)\left(\frac{r}{\sqrt{r}}\right) = \frac{-\frac{1}{\sqrt{r}} \times 4r}{-14\sqrt{r}} = \boxed{\frac{4}{14}}$$

$$f'(-1) = \frac{r}{r} \quad g(x) = f(x+1) + f(r(x+1)) \quad g'(-r) = ?$$

(10 سوال)

$$g'(x) = f'(x+1) + r f'(r(x+1)) \quad x = -r \rightarrow g'(-r) = f'(-1) + r f'(r)$$

$$\omega \text{ solution} \rightarrow f'(-1) = f'(r) = \frac{r}{r} \rightarrow g'(-r) = r f'(-1) - r \times \frac{r}{r} = \boxed{4}$$

آپ اپنا

$$\lim_{h \rightarrow 0} \frac{f'(a+h) - f'(a-h) + f'(a)}{h(a-h)}$$

$$f(x) = (x-1)^2 \sqrt{x+1} \quad (9 \text{ سوال})$$

$$f'(a) = 2$$

جواب $\rightarrow \frac{-2f'(a)f'(a) + 2f'(a)}{a}$

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

$$\rightarrow f'(a) = 2 + \frac{1}{1} = \frac{3}{1}$$

$$\rightarrow \frac{(-2 \times \frac{3}{1} \times 2) + 2(\frac{3}{1})}{a} = \frac{-\frac{6}{1} + \frac{6}{1}}{a} \rightarrow \frac{-\frac{6}{1}}{a} + \frac{6}{a}$$

$$\rightarrow \frac{-\frac{6}{1}}{1} + \frac{6}{1} \rightarrow \boxed{\frac{-6}{1}}$$

$$y = x^2 - 5x + 2 \quad 4y - 3x = 1 \quad (10 \text{ سوال})$$

$$\downarrow \quad \hookrightarrow \text{Slope} = \frac{3}{4} = \frac{1}{r}$$

$$y' = 2x - 5$$

$$\text{Slope} \rightarrow \frac{1}{r} m' = -1 \rightarrow m' = -r$$

$$2x - 5 = -r \Rightarrow 2x = 3 \Rightarrow x = \frac{3}{2} \Rightarrow y = 2 \Rightarrow \boxed{(1.5, 2)}$$