

پارسیندی

$$f(x) = \begin{cases} a + \sqrt{x^r} & x < 1 \\ b \sqrt[r]{x^r} & x > 1 \end{cases} \quad a+b=?$$

$$f(1) = b$$

① د ل

$$f'(x) = \frac{r}{r} b x^{-\frac{1}{r}} = \frac{rb}{x^{\frac{1}{r}}} = \frac{rb}{\sqrt[r]{x}}$$

$$\lim_{x \rightarrow 1^+} f(x) = b$$

$$a+1=b$$

$$\lim_{x \rightarrow r} f(x) = a+1 \quad a-b=-1$$

$$f'(x) = \frac{rx}{x\sqrt{x^r}} = \frac{x}{\sqrt{x^r}} \quad \frac{x}{\sqrt{x^r}} = \frac{rb}{\sqrt[r]{x}}$$

$$f(x) = \frac{|rx-d|}{\sqrt[r]{x^r}} \quad g(x) = \frac{\sqrt{x^r-dx+d} + \sqrt{rx}}{\sqrt[r]{x^r}} \quad f'(1) - rg'(1) = ?$$

② د ل

$$f'(1) - rg'(1) = \frac{-(rx-d)}{\sqrt[r]{x^r}} - r \frac{|x-r| + \sqrt{rx}}{\sqrt[r]{x^r}} = \frac{-rx+d+rx-d-r\sqrt{rx}}{\sqrt[r]{x^r}}$$

$$= \frac{-r\sqrt{rx}}{\sqrt[r]{x^r}} = \frac{-r\sqrt{r} \times x^{\frac{1}{r}}}{x^{\frac{r}{r}}} = -r\sqrt{r} x^{-\frac{1}{r}} \Rightarrow (-r\sqrt{r} x^{-\frac{1}{r}})' = -r\sqrt{r} \times \frac{1}{r} x^{-\frac{1}{r}}$$

$$= \frac{\sqrt{r}}{r}$$

$$f(x) = \begin{cases} bx+c & x < a \\ \frac{1}{x} & x \geq a \end{cases} \quad ac=?$$

③ د ل

$$\lim_{x \rightarrow a^-} f(x) = R$$

$$f(a) = \frac{1}{a}$$

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

$$f'(a) = -\frac{1}{a^2}$$

$$f'(a) = b$$

$$|a^2b = -1| \text{ (I)}$$

$$\lim_{x \rightarrow a^+} f(x) = \lim_{x \rightarrow a^-} f(x) = f(a)$$

$$\lim_{x \rightarrow a^+} f(x) = \frac{1}{a}$$

$$\lim_{x \rightarrow a^-} f(x) = ab+c \Rightarrow \frac{1}{a} = ab+c \Rightarrow$$

$$|a^2b+c=1| \text{ (II)}$$

$$-1+c=1 \Rightarrow c=2$$

$$f(x) = \begin{cases} b & x < a \\ b + (x-a)^m & x \geq a \end{cases} \quad m \geq 1 \Rightarrow \begin{cases} f'_-(a) = 0 \\ f'_+(a) = m(a-a)^{m-1} = 0 \end{cases} \Rightarrow f'_-(a) = f'_+(a)$$

$m = 0 \rightarrow f'_-(a) = f'_+(a) \times$   
 $m = 1 \rightarrow f'_-(a) = f'_+(a) = 1 \checkmark$

(ف) د. س

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

(ا) د. س

$$g'(-\sqrt[r]{r}) f'(g(-\sqrt[r]{r})) = ?$$

$$(f \circ g)'(-\sqrt[r]{r}) = g'(\sqrt[r]{r}) \times f'(g(\sqrt[r]{r})) \Rightarrow x = -\sqrt[r]{r} \Rightarrow \begin{cases} f(x) = \frac{1}{\sqrt[r]{rx}} \\ g(x) = \frac{1}{rx^r} \end{cases}$$

$$f(g(x)) = f\left(\frac{1}{rx^r}\right) = \frac{1}{\sqrt[r]{\frac{r}{rx^r}}} = x \Rightarrow (f \circ g)'(x) = 1$$

$$y = -ax - a \quad f'(r) - f(r) = r \quad \frac{f(r)}{f'(r)} = ? \quad \left( \frac{-\frac{1}{r}}{\frac{r}{r^2}} = -\frac{r}{4} = -\frac{1}{r} \right) \quad (ق) د. س$$

$$\begin{cases} f(r) = -ra - a \\ f'(r) = -a \end{cases} \Rightarrow f'(r) - f(r) = -a - (-ra - a) = r \Rightarrow$$

$$-a + ra + a = r \Rightarrow ra + a = r \Rightarrow ra = -r \Rightarrow a = -\frac{r}{r}$$

$$f(r) = -r\left(-\frac{r}{r}\right) - a = \frac{r}{r} - a = -\frac{1}{r}$$

$$f'(r) = -a = \frac{r}{r}$$

$$f(x) = \left(x \left[x^r + \frac{1}{r}\right]\right)^r + 1 \quad g(x) = \frac{1}{\sqrt[r]{x^r - 1}} \quad f \circ g = ? \quad f \circ g / -12\sqrt{r} = ?$$

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

$$g\left(\frac{r}{\sqrt{r}}\right) = \frac{1}{\sqrt[r]{\frac{r}{\sqrt{r}} - 1}} = r \Rightarrow (f \circ g)' \left(\frac{r}{\sqrt{r}}\right) = g'\left(\frac{r}{\sqrt{r}}\right) \cdot f'(r) \quad (I)$$

$$g(x) = (x^r - 1)^{-\frac{1}{r}} \Rightarrow g'(x) = -\frac{1}{r} (x^r - 1)^{-\frac{r}{r}} \cdot rx = \frac{-rx}{r \sqrt[r]{(x^r - 1)^r}}$$

$$\Rightarrow g'\left(\frac{r}{\sqrt{r}}\right) = \frac{-rx \frac{r}{\sqrt{r}}}{r \sqrt[r]{\left(\frac{r}{\sqrt{r}} - 1\right)^r}} = \frac{-14}{\sqrt{r}} = -\sqrt{r}$$

ادامہ سوال (✓)

$$f(x) = (x^2)^r + 1 \Rightarrow f'(x) = 2rx = f'(2) = 48$$

$$\textcircled{I} \text{ سب سے پہلے } (f \circ g)' \left( \frac{r}{\sqrt{h}} \right) = -\sqrt{h} \times 48 = -12\sqrt{h} \times 4$$

$$f'(-1) = \frac{r}{r} \quad f(x+a) = f(x) \xrightarrow{\text{سب سے پہلے}}$$

سوال (A)

$$g(x) = f(x+1) + f(2x+1) \quad 1 \times f'(x+a) = f'(x)$$

$$g'(-2) = ? \Rightarrow f'(x+a) = f'(x)$$

$$g(x) = f(x+1) + f(2x+1) \rightarrow g'(x) = f'(x+1) + 2f'(2x+1)$$

$$g'(-2) = f'(-2+1) + 2f'(-4+1) = f'(-1) + 2f'(-3) \quad \textcircled{I}$$

$$f'(-3) = f'(-3-a) = f'(-1) \xrightarrow{\textcircled{I} \text{ سب سے پہلے}} g'(-2) = 3f'(-1) = 3 \times \frac{r}{r} = 3$$

$$f(x) = (x-a)^r \sqrt{x+r}$$

سوال (9)

$$\lim_{h \rightarrow 0} \frac{f'(a-h) - r f'(a-h) + r}{h(a-h)} = ? = \lim_{h \rightarrow 0} \frac{(f(a-h)-1)(f(a-h)-r)}{h(a-h)}$$

$$h \rightarrow 0 \Rightarrow \lim_{h \rightarrow 0} \frac{f(a-h)-1}{a-h} \times \lim_{h \rightarrow 0} \frac{f(a-h)-r}{h} = \frac{f(a-h)-r}{h} \times \lim_{h \rightarrow 0} \frac{f(a-h)-1}{h}$$

$$= \frac{r-1}{a} \times \lim_{h \rightarrow 0} \frac{f(a+(-h)) - f(a)}{h} = -\frac{1}{a} \lim_{h \rightarrow 0} \frac{f(a+(-h)) - f(a)}{-h}$$

$$= -\frac{1}{a} \lim_{t \rightarrow 0} \frac{f(a+t) - f(a)}{t} = -\frac{1}{a} f'(a)$$

$$f'(x) = 1 \times \sqrt{x+r} + \frac{x-a}{r\sqrt{(x+r)^r}}$$

$$f'(a) = \sqrt{a} + \frac{1}{r\sqrt{46}} = r + \frac{1}{12} = \frac{r2}{12}$$

$$-\frac{1}{a} f'(a) = -\frac{1}{a} \times \frac{r2}{12} = -\frac{a}{12}$$

سوال (2)

$$y = x^r - 6x + a$$

$$4y - rx = 1 \perp \Rightarrow 4y = 1 + rx \Rightarrow y = \frac{1}{4}x + \frac{1}{4} \Rightarrow m = \frac{1}{4}$$

$$\text{سب سے پہلے } \frac{dy}{dx} = -r \Rightarrow y' = rx - 6 = -r \Rightarrow x = 1 \Rightarrow y = 1 - 6 + a = r \Rightarrow \begin{cases} x = 1 \\ y = r \end{cases}$$