

کشف سنج

تابع f مستقیم
 ① $f(x) = \begin{cases} a + \sqrt{x} & x < 1 \\ b\sqrt{x} & x \geq 1 \end{cases}$
 در صورتی که تابع پیوسته باشد
 یعنی در $x=1$ پیوسته باشد

در $x=1$ پیوسته باشد
 $\lim_{x \rightarrow 1^-} f(x) = \lim_{x \rightarrow 1^-} (a + \sqrt{x}) = a + 1$
 $\lim_{x \rightarrow 1^+} f(x) = \lim_{x \rightarrow 1^+} (b\sqrt{x}) = b$
 $a + 1 = b \rightarrow b = a + 1$

در $x=1$ پیوسته باشد
 $a + b = 2$

② $f(x) = \frac{1}{\sqrt{x}} - \frac{1}{x}$
 $f(1) = \frac{1}{\sqrt{1}} - \frac{1}{1} = 0$

$g(x) = \frac{1}{\sqrt{x}} - \frac{1}{x}$
 $g(1) = \frac{1}{\sqrt{1}} - \frac{1}{1} = 0$

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

③ $f(x) = \begin{cases} bx + c & x < a \\ \frac{1}{x} & x \geq a \end{cases}$

$b = -\frac{1}{a^2}$ $ab + c = \frac{1}{a}$

$b = -\frac{1}{a^2}$ $ab \Rightarrow -\frac{1}{a} \Rightarrow -\frac{1}{a} + c = \frac{1}{a}$

$\Rightarrow \frac{c}{a} = \frac{2}{a} \Rightarrow ac = 2$

④ $f(x) = \begin{cases} b & x < a \\ b + (x-a)^m & x \geq a \end{cases}$
 تابع f در $x=a$ پیوسته باشد
 $m(a-a) = 0$
 $m=0$ $\rightarrow$ (عدد)

⑤ $f(x) = \frac{1}{\sqrt{x-1}}$ $g(x) = \frac{1}{x^3 - |x^3|}$

$f(g(x)) \Rightarrow f\left(\frac{1}{x^3 - |x^3|}\right) \Rightarrow \frac{1}{\sqrt{\frac{1}{x^3 - |x^3|} - 1}}$

①

$$y = a^r - \varepsilon_n + \delta$$

$$yy - y_{n-1}$$

$$\frac{y_{n+1}}{y}$$

$$\frac{1}{r} \rightarrow -r$$

$$y_n - \varepsilon = -r$$

$$y_n = r$$

$$\varepsilon_n = 1$$

Cherien

حل المسألة

(4) $y = -ax - x$ $f(x) = -ra - x$

$f'(x) - f(x) = r$

$-a + ra + x = r$

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

$\frac{-ax - x}{-a} \Rightarrow \frac{\frac{r}{r}x - x}{\frac{r}{r}} \Rightarrow \frac{\frac{r}{r} - \frac{1}{r}}{\frac{r}{r}} = \frac{-\frac{1}{r}}{\frac{r}{r}}$

$\Rightarrow \frac{-1}{r}$

(5) $f(x) = \left(x \left[x^r + \frac{1}{r}\right]\right)^r$ $g(x) = \frac{1}{\sqrt{x^2-1}}$ $g'(x) = \frac{-x}{(x^2-1)^{3/2}}$

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

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

$\frac{-x \times -1 \times \sqrt{x^2-1}}{(x^2-1)^{3/2}} = \frac{x}{\sqrt{x^2-1}}$

(6) $g(x) = f(x+1) + f(x+10)$, $f'(-1) = \frac{r}{r}$ $g'(x) = ?$

$g'(x) = f'(x+1) + r f'(x+10)$

$f'(-1) + r f'(\varepsilon) \Rightarrow \varepsilon f'(-1) \Rightarrow \varepsilon \times \frac{r}{r} = \varepsilon$

(7) $f(x) = (x-\varepsilon)^r \sqrt{x+r}$ $\lim_{h \rightarrow 0} \frac{f(a-h) - r f(a-h) + r}{h(a-h) \rightarrow a h - h^2}$

$x^r - r x + r = \dots$

$f(a-h) = f(a) = r$

$\frac{f(a-h) - r f(a-h) + r}{h(a-h) \rightarrow a h - h^2}$

$f'(x) = \dots$

$\frac{-f'(a-h)}{a}$

$\frac{-ra}{a} \Rightarrow \frac{-r}{1}$