

درازا هم ببر

معین نصیری

19, 75

کالیف شماره 3

افزید!

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

①

(1, 75)

$$f(x) = \begin{cases} 2x-1; [x] \geq \Delta \rightarrow 2x-1; x \geq \Delta \\ 2x+3; [x] < \Delta \rightarrow 2x+3; x < \Delta \end{cases}$$

$$\rightarrow \begin{cases} x \geq \Delta \Rightarrow \sqrt{2x-1-x+1} \rightarrow \boxed{x \geq 0} \\ x < \Delta \Rightarrow \sqrt{2x+3-x+1} \rightarrow 2x+2 \geq 0 \rightarrow \boxed{x \geq -\frac{1}{2}} \end{cases}$$

$$\emptyset D_f = \left[-\frac{1}{2}, \Delta\right) \cup [\Delta, +\infty) \Rightarrow D_f = \left[-\frac{1}{2}, +\infty\right)$$

$$f(x) = \frac{2x^3 + 3x^2 + 10x + 3}{(2x^2 + 2x + 1)^2} \xrightarrow{\text{مخرج}} \frac{(2x+1) \cdot (2x^2 + 2x + 1) - 2(2x^2 + 2x + 1)^2}{(2x+1)^4} = \frac{2}{2x+1}$$

$2x+1 \neq 0 \Rightarrow x \neq -\frac{1}{2}$

(2) ②

$$\emptyset D_f = \mathbb{R} - \left\{-\frac{1}{2}\right\}$$

$$f(x) = \begin{cases} \frac{x^3 + x^2 - x - 2}{x^2 - 1} & ; x \neq \pm 1 \\ \frac{ax + 2}{x + b} & ; x = \pm 1 \end{cases}$$

③

(2)

$$g(x) = x + C$$

$$x=0 \rightarrow C = \frac{-2}{-1} \sim \boxed{C=2}$$

$$b+C=?$$

$$x=1 \rightarrow 1+2 = \frac{a+2}{1+b} \rightarrow 3+3b = a+2$$

$$x=-1 \rightarrow -1+2 = \frac{-a+2}{-1+b} \rightarrow -1+b = -a+2$$

$$\emptyset \Rightarrow \frac{1}{2} + 2 = \frac{2}{\Delta} \Rightarrow \frac{\Delta}{2}$$

$$\Rightarrow \begin{cases} 3b - a = -1 \\ b + a = 3 \end{cases}$$

$$\begin{cases} b=2 \\ a=1 \end{cases}$$

$$f(u) = \frac{u+1}{u-c} \quad u=0 \rightarrow \frac{1}{-c} = \frac{-1}{b} \sim b=c$$

(۴)

(۲)

$$g(u) = \frac{u^2-1}{u^2+au+b} \rightarrow \frac{(u-1)(u+1)}{(u-c)(u-c)} \sim \boxed{c=+1} \quad \boxed{b=+1}$$

$$a+b+c=?$$

$$(u-1)(u-1) \rightarrow u^2 - 2u + 1$$

$$(u-c)^2 = u^2 + au + b \rightarrow \boxed{c=1} \quad \boxed{b=1} \rightarrow \boxed{a=-2}$$

$$\phi \rightarrow 1+1-2 = 0$$

$$f(u) = (u-1)^2(u-1) \rightarrow \begin{matrix} u=u+1 & (u-1)^2(u) \rightarrow (u^2-2u+1)(u) \rightarrow u^3-2u^2+u \\ u=1-u & (-u-1)^2(-u) \rightarrow (-u^2-2u-1)(-u) \rightarrow u^3+2u^2+u \end{matrix}$$

(۲) (۵)

$$\phi \Rightarrow g(u) = -1u^2$$

$$f(1-u) = \begin{cases} \sqrt{u}+1 & ; u \leq 0 \\ \sqrt{u} & ; u > 0 \end{cases}$$

$$1-2u=-1 \sim \boxed{u=1} \rightarrow f(1)=1$$

$$1-2u=3 \sim \boxed{u=-1} \rightarrow f(-1)=1$$

$$f(1)=1$$

(۲) (۴)

$$f(-1)+f(1)=? \rightarrow 1+1=2$$

$$f(x+\sqrt{u}) = x^3 + 3x \xrightarrow{x=4} f(6) = (4)^3 + 3(4) = 64 + 12 = 76 \checkmark$$

(۷) (۲)

$$f(6) = ? \quad u + \sqrt{u} = 6 \rightarrow \boxed{u=5} \checkmark$$

$$f(u) = u^3 + u \rightarrow u(u^2 + 1)$$

$$f(u-1) + f(1-u) = ? \rightarrow \left[(u-1)^3 + u-1 \right] + \left[(1-u)^3 + 1-u \right] = \underline{0} \checkmark$$

(۸) (۲)

$$f(u) = \sqrt{4u - 3a} + k - 1$$

$$D_{f(u)} = 1 \rightarrow f(1) = \sqrt{4 - 3a} + k - 1$$

$$g(u) = \sqrt{b - 4u} + 3k$$

$$g(1) = \sqrt{b - 4} + 3k$$

$$2f - g = \{(1, k)\}$$

$$\Rightarrow 2\sqrt{4 - 3a} + 2k - 2 - \sqrt{b - 4} - 3k = k$$

$$3a - \frac{b}{2} - k = ?$$

$$\Rightarrow 2\sqrt{4 - 3a} - \sqrt{b - 4} = 2k + 2$$

$$\sqrt{4 - 3a} = \sqrt{b - 4}$$

برای اینکه معادله برقرار باشد، هر دو طرفه باید تا آنکه در نهایت، رابطه‌ای وجود نداشته باشد.

$$4 - 3a = b - 4 \Rightarrow \boxed{b = 4}$$

$$\Rightarrow \boxed{a = \frac{4}{3}}$$

$$\Rightarrow 0 = 2k + 2 \Rightarrow \boxed{k = -1}$$

$$\Rightarrow 3\left(\frac{4}{3}\right) - \frac{(4)}{2} - (-1) = 4 - 2 + 1 = 3 \checkmark$$

درازاہم سے A

معین نصیری

کتابتِ علامہ ۳

$$f(u) = \sqrt{m - u} + n \sim m - u > 0 \sim \boxed{m > u}$$

(1)
(2)

$$g(u) = \sqrt{2u + 2} \sim \boxed{u > -1}$$

$$-1 < u < m$$

↓
 $\boxed{m = 7}$

$$D_{f \times g} = [-1, 7]$$

$$f - g(3) = 4\sqrt{2} \rightarrow \sqrt{4} + n - (\sqrt{1}) = 4\sqrt{2} \Rightarrow 2 + n - 1 = 4\sqrt{2} \Rightarrow n = 1\sqrt{2} - 1$$

$$m + n = ?$$

$$\rightarrow 1\sqrt{2} - 1 + 7 = \boxed{1\sqrt{2} + 6}$$

✓