

بفرض

آزمون عالی دنا مل نویسنده

$$f(x) = \begin{cases} (a+1)(x+r) & x > 1 \\ 3a+2x & x \leq 1 \end{cases}$$

$$\begin{aligned} r f(0) &= f(-r) + a \\ r(a+1)r &= 3a - r + a \\ 1fa + 1f &= 3a - r + a \\ 10a &= -11 \\ a &= -1.1 \end{aligned}$$

a = ?

(1)

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

$$\begin{aligned} f(r-\sqrt{r}) + f(r+\sqrt{r}) &\rightarrow \frac{\sqrt{(r-\sqrt{r})(r+\sqrt{r})}}{\sqrt{r-\sqrt{r}}} = 1 \Rightarrow a + \frac{1}{a} + r + \frac{1}{a} + a + r = \dots \\ r(a + \frac{1}{a} + r) &\Rightarrow r(\sqrt{r-\sqrt{r}} + \sqrt{r+\sqrt{r}} + r) \\ \hookrightarrow (a + \frac{1}{a})^2 &\Rightarrow (\sqrt{r-\sqrt{r}} + \sqrt{r+\sqrt{r}})^2 \Rightarrow r + r + r^2 \rightarrow \sqrt{r} \end{aligned}$$

(2)

$$\begin{aligned} r f(x) - 3 f(-x) &= f x^2 - x \\ f(-x) &\rightarrow r f(-x) - 3 f(x) = -f x^2 + x \\ \rightarrow -5 f(x) &= r x^2 + x \\ f(x) &= \frac{r x^2 + x}{-5} \Rightarrow f(x) = -\frac{f x^2 - x}{5} \end{aligned}$$

(3)

$$\begin{aligned} (x+r) f(x) - 3 x f(x+r) &= f x^2 - m x + 3m - 1 \xrightarrow{x=0} \begin{cases} r f(0) = 3m - 1 \\ r f(0) = 1r + 3m - 1 \end{cases} \\ f(0) &= ? \rightarrow \frac{r f(0) - 1}{r} \Rightarrow \frac{r f(0) - 1}{r} = \frac{r f(0)}{r} \\ 1r + 3m - 1 &= 3m - 1 \\ 1r &= 0 \\ f(0) &= \frac{1r}{f} = m \end{aligned}$$

(4)

$$\begin{aligned} f(x) + f\left(\frac{1}{x}\right) &= \frac{3x^2 - 11x + 3}{x} \xrightarrow{x=1} r f(1) \Rightarrow \frac{r+11+r}{-1} = -11 \\ f(1) &= ? \quad a x + b \cdot \frac{a}{x} + b = \frac{3x^2 - 11x + 3}{x} \quad \begin{cases} a = r \\ b = -r \end{cases} \Rightarrow f(1) = -r - r = -9 \end{aligned}$$

(5)

$$\begin{aligned} f(x) &= (x-1)\sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow 1 \geq x \\ g(x) &= -\sqrt{(1-x)^3} \rightarrow (1-x)^3 \geq 0 \rightarrow 1-x \geq 0 \rightarrow 1 \geq x \end{aligned}$$

(6)

$$\begin{aligned} f(x) &= x\sqrt{x} \rightarrow x \geq 0 \rightarrow D_f = [0, +\infty) \\ g(x) &= \sqrt{x^3} \rightarrow x^3 \geq 0 \rightarrow x \geq 0 \rightarrow D_g = [0, +\infty) \end{aligned}$$

(7)

$$f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \Rightarrow x \geq 0 \quad Df = [0, +\infty)$$

$$g(x) = \sqrt{x - |x|} \Rightarrow x - |x| \geq 0 \rightarrow x \geq |x| \rightarrow Dg = [0, +\infty)$$

$$\sim g(x) = 0 \quad f(x) \xrightarrow{x \rightarrow 2} [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \rightarrow (\sqrt{2} - 1) = 0 \quad \text{ب } 0 < \sqrt{x} - \lfloor \sqrt{x} \rfloor < 1$$

من 0 إلى 1

$$f = \{(1, 2), (2, 3), (3, 1), (0, 0)\}$$

$$g = \{(-1, 1), (1, 1), (2, 3), (3, 0), (0, 2), (\sqrt{2}, 1)\}$$

$$\text{أ) } \left(\frac{f+g}{f-g} \right)(1) \Rightarrow \frac{2+1}{2-1} = 3$$

$$\text{ب) } \left(\frac{f+g}{f-g} \right)(2) \Rightarrow \frac{3+3}{3-3} \Rightarrow \text{undefined}$$

$$\text{ج) } f(0)g(-1) = 0 \times 1 = 0$$

$$f(x) = \{(2, 1), (-1, 4), (0, 0), (-2, 2), (3, -1)\}$$

$$\text{أ) } g(x) = f(3x-1) \rightarrow g(x) = \{(1, 1), (0, 4), (\frac{1}{3}, 0), (\frac{2}{3}, 2), (\frac{4}{3}, -1)\}$$

$$2 = 3x - 1$$

$$-1 = 3x - 1$$

$$0 = 3x - 1$$

$$-2 = 3x - 1$$

$$3 = 3x - 1$$

$$\text{ب) } h(x) = f(|x|)$$

$$h(x) = \{(-2, 1), (-1, 4), (0, 0), (2, 1), (3, -1)\}$$

$$|x| = 2$$

$$x = 2, -2$$

$$|x| = -1$$

$$|x| = 0$$

$$x = 0$$

$$|x| = -2$$

$$|x| = 3$$

$$x = 3, -3$$