

۲. آزمون عالی نوشتی

$$2f(a) = 2(a+1)(1) = 14a + 14$$

$$f(-2) = 3a - 4 + a$$

$$14a + 14 = 4a - 4$$

$$10a = -4 - 14$$

$$10a = -18 \quad a = \frac{-18}{10} = \frac{-9}{5}$$

$$(2-\sqrt{3})(2+\sqrt{3})=1 \rightarrow \text{مکمل شود} \quad \sqrt{2} = \sqrt{2-\sqrt{3}} = \frac{1}{\sqrt{2+\sqrt{3}}}$$

$$a = \sqrt{2+\sqrt{3}} \quad \frac{1}{a} = \sqrt{2-\sqrt{3}}$$

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

$$f(2-\sqrt{3}) = \frac{1}{a} + a + 2$$

$$f(2-\sqrt{3}) + f(2+\sqrt{3}) = 2(a + \frac{1}{a}) + 4 \rightarrow \boxed{4+2\sqrt{9}}$$

$$2f(x) - 3f(-x) = 4x^2 - x$$

$$2f(-x) - 3f(x) = 4x^2 + x$$

$$\begin{cases} 2f(-x) - 3f(x) = 4x^2 + x \\ -3f(-x) + 2f(x) = 4x^2 - x \end{cases}$$

$$\begin{cases} 4f(x) - 9f(x) = 12x^2 + 3x \\ -9f(-x) + 4f(x) = 12x^2 - 2x \end{cases}$$

$$-5f(x) = 10x^2 + x$$

$$5f(x) = -10x^2 - x$$

$$\boxed{f(x) = -2x^2 - \frac{x}{5}}$$

$$(x+2)f(x) - 3xf(x+2) = 4x^2 - mx + 3m - 1$$

$$5m + 10 = 4m - 3$$

$$x=0 \rightarrow 2f(0) = 3m - 1 \times 3 \quad 4f(0) = 4m - 3$$

$$10 = 5m$$

$$m = \frac{10}{5}$$

$$x=-2 \rightarrow 4f(0) = 5m + 10$$

$$2f(0) = 3(\frac{10}{5}) - 1$$

$$2f(0) = \frac{20}{5} - 1$$

$$f(0) = \frac{20}{5} - \frac{1}{2}$$

$$f(x) + f(\frac{1}{x}) = \frac{3x^2 - 12x + 3}{x}$$

$$\text{تابع خطی} \quad f(x) = ax + b$$

$$f(\frac{1}{x}) = \frac{a}{x} + b$$

$$\div \quad 3x - 12 + \frac{3}{x} = ax + b + \frac{a}{x} + b$$

$$3x - 12 + \frac{3}{x} = ax + b + \frac{a}{x}$$

$$a=3 \quad b=-12 \quad b=-4$$

$$f(x) = 3x - 4$$

$$f(-1) = -3 - 4 = \boxed{-7}$$

$$f(u) = (u-1)\sqrt{1-u} \rightarrow -(1-u)\sqrt{1-u}$$

$$f(u) = -\sqrt{(1-u)^3} \quad g(u) = -\sqrt{(1-u)^3}$$

$$f(u) = g(u)$$

$$f(u) = u\sqrt{u} \quad g(u) = \sqrt{u^3} \quad u \geq 0 \rightarrow \text{دامنه های برابر}$$

$$f(u)\sqrt{u \times u^2} \rightarrow f(u) = \sqrt{u^3}$$

$$f(u) = g(u)$$

$$\sqrt[n]{u} - [\sqrt[n]{u}] < 1 \rightarrow f(u) = 0 \quad Df = [\omega + \infty)$$

$$g(u) = u - |u| \geq 0 \quad \begin{matrix} + = \checkmark \\ - = \times \\ 0 = \checkmark \end{matrix}$$

$$Df = [0 + \infty)$$

$$f(u) = g(u)$$

$$\text{الف) } \frac{f(1) + g(1)}{f(1) - g(1)} = \frac{1 + 1}{1 - 1} = \mu$$

$$\text{ج) } f(0)g(-1)$$

$$f(0) = 0$$

$$g(-1) = 1$$

$$0 \times 1 = 0$$

$$\text{ب) } \frac{f(r) + g(r)}{f(r) - g(r)} = \frac{r + r}{r - r} = \frac{4}{0} = \infty$$

تعریف نشده

$$g(u) = f(r_{n-1}) \quad r_{n-1} = 1 \quad u = 1$$

$$r_{n-1} = -1 \quad u = 0$$

$$r_{n-1} = 0 \quad u = \frac{1}{r}$$

$$r_{n-1} = -1 \quad u = -\frac{1}{r}$$

$$r_{n-1} = r \quad u = \frac{r}{r}$$

$$g(u) = \left\{ (1, 1) (0, 1) \left(\frac{1}{r}, 1\right) \left(-\frac{1}{r}, 1\right) \left(\frac{r}{r}, 1\right) \right\}$$

$$h(u) = f(|u|)$$

$$|u| = 0 \rightarrow u = 0 \rightarrow h(0) = f(0) = \omega$$

$$|u| = 1 \rightarrow u = \pm 1 \rightarrow h(\pm 1) = f(1) = 1$$

$$|u| = r \rightarrow u = \pm r \rightarrow h(\pm r) = f(r) = -1$$

$$h = \left\{ (\omega, \omega) (-1, 1) (1, 1) (-r, -1) (r, -1) \right\}$$