

Date _____ Subject _____

$$Df \stackrel{?}{=} Dg \text{ و } f(x) \stackrel{?}{=} g(x) \quad (6)$$

$$\left. \begin{aligned} Df &= 1-x \geq 0 \leadsto x \leq 1 \\ Dg &= (1-x)^3 \geq 0 \leadsto x \leq 1 \end{aligned} \right\} Df = Dg$$

$$(x-1)\sqrt{1-x} = \sqrt{(1-x)^2} \sqrt{1-x} \Rightarrow \sqrt{(1-x)^3}$$

$$f(x) = g(x) \checkmark$$

$$Df = Dg = [0, +\infty) \quad (7)$$

نابطه‌ها نیز برابر اند پس $f(x) = g(x)$

$$Df = Dg = [0, +\infty) \quad (8)$$

نابطه‌ها برابر = پس $f(x) = g(x)$

$$\text{الف) } \frac{f(1) + g(1)}{f(1) \cdot g(1)} = \frac{1+1}{1-1} = \frac{2}{0} \quad (9)$$

$$\Rightarrow \frac{1+1}{1-1} \propto \text{تعریف نشده}$$

$$f(1) = 0 \quad (10)$$

$$\text{الف) } 3x-1=2 \leadsto x=1 \quad (11)$$

$$3x-1=-1 \leadsto x=0$$

$$3x-1=0 \leadsto x=\frac{1}{3}$$

$$3x-1=-2 \leadsto x=-\frac{1}{3}$$

$$3x-1=3 \leadsto x=\frac{4}{3}$$

$$g(x) = \left\{ \left(\frac{1}{3}, 1\right), \left(\frac{4}{3}, 2\right), \left(-\frac{1}{3}, 0\right), \left(0, -1\right), \left(1, 0\right) \right\}$$

$$g(x) = \left\{ \left(\frac{1}{3}, 1\right), \left(-\frac{1}{3}, 1\right), \left(0, 2\right), \left(-\frac{2}{3}, 1\right), \left(\frac{4}{3}, 1\right) \right\}$$

$$(-\frac{2}{3}, -1) \leadsto \text{غیر قابل قبول}$$

$$2f(x) = f(-x) + a \leadsto 18a + 18 = 8a - 18 \quad (1)$$

$$\leadsto a = -18$$

$$\sqrt{1-\sqrt{3}} + \frac{1}{\sqrt{1-\sqrt{3}}} + \frac{1}{\sqrt{1+\sqrt{3}}} + \frac{1}{\sqrt{1+\sqrt{3}}} \quad (2)$$

$$\Rightarrow \sqrt{1-\sqrt{3}} + \sqrt{1+\sqrt{3}} + \frac{1}{\sqrt{1-\sqrt{3}}} + \frac{1}{\sqrt{1+\sqrt{3}}} \Rightarrow \frac{1}{\sqrt{1-\sqrt{3}}} \times \frac{\sqrt{1+\sqrt{3}}}{\sqrt{1+\sqrt{3}}} = \frac{\sqrt{1+\sqrt{3}}}{1}$$

$$\frac{1}{\sqrt{1-\sqrt{3}}} \times \frac{\sqrt{1+\sqrt{3}}}{\sqrt{1+\sqrt{3}}} = \frac{\sqrt{1+\sqrt{3}}}{1}$$

$$\sqrt{1-\sqrt{3}} + \sqrt{1+\sqrt{3}} = 1 \leadsto 1^2 = 1 - \sqrt{3} + 1 + \sqrt{3} + 2 \leadsto 1^2 = 4 \leadsto 1 = 2$$

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

$$\Rightarrow \begin{cases} 4f(x) - 6f(-x) = 8x^2 - 2x \\ 6f(-x) - 9f(x) = 6x^2 - 3x \end{cases}$$

$$\leadsto 2f(x) = 2x^2 - x$$

$$\leadsto f(x) = -x^2 + x$$

$$\text{if } x=0 \leadsto 2f(0) = 3m+1 \leadsto f(0) = \frac{3m+1}{2} \quad (4)$$

$$\text{if } x=-2 \leadsto 6f(0) = 2m+1 \leadsto f(0) = \frac{2m+1}{6}$$

$$\leadsto \frac{3}{2}m + \frac{1}{2} = \frac{2m+1}{6} \leadsto m = \frac{1}{5}$$

$$f(0) = \frac{3}{5}m + \frac{1}{5} \leadsto f(0) = \frac{2}{5}$$

$$ax+b+\frac{a}{x}+b = \frac{3x^2-12x+3}{x}$$

$$\leadsto \frac{ax^2+bx+a+bx}{x} = \frac{3x^2-12x+3}{x}$$

$$\text{مطابقت} \rightarrow a=3, b=-6 \leadsto f(x) = 3x-6$$

$$\leadsto f(-1) = 3(-1)-6 = -9$$