

$$\begin{aligned} 2(a+1)(v) &= 3a - 4 + a \\ 2(va+1) &= 3a - 4 + a \\ 1 \cancel{v} a + 1 \cancel{v} &= \cancel{3} a - 4 + \cancel{a} \\ 1 \cdot a &= -1 \cdot 4 \quad a = -1/4 \end{aligned}$$

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$$\begin{aligned} (2-\sqrt{3})(2+\sqrt{3}) &= 1 \quad f(2-\sqrt{3}) + f(2+\sqrt{3}) \\ \frac{1}{\sqrt{2-\sqrt{3}}} &= \sqrt{2+\sqrt{3}} \\ 2\sqrt{2-\sqrt{3}} + 2\sqrt{2+\sqrt{3}} + 4 &= 4 \\ (\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}})^2 &= 2-\sqrt{3} + 2+\sqrt{3} + 2(1) = 4 \\ \sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}} &= \sqrt{4} \\ \Rightarrow \sqrt{4+2\sqrt{4}} & \end{aligned}$$

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$$\begin{aligned} 2f(m) - 3f(-n) &= 6m^2 - 2n \times 2 \quad 4f(m) - 3f(-n) = 4m^2 - 2n \\ 2f(-n) - 3f(n) &= 4n^2 + 2n \times 2 \quad 4f(-n) - 9f(n) = 4n^2 + 2n \\ -5f(n) &= 2n^2 + 2n \\ f(n) &= \frac{-2n^2 - 2n}{5} \end{aligned}$$

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$$\begin{aligned} x=0 \quad 2f(0) &= 3m-1 \\ x=-2 \quad 4f(0) &= 14 + 2m + 3m \times 2 \xrightarrow{\div 2} 2f(0) = 7 + \frac{5}{2}m \\ \Rightarrow 3m-1 &= 7 + \frac{5}{2}m \\ \frac{3}{2}m - \frac{5}{2}m &= 8 \\ \frac{-2}{2}m &= 8 \quad m = 4 \times \frac{2}{-2} = -4 \end{aligned}$$

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$$\begin{aligned} ax + b + \frac{a}{x} + b &= \frac{3x^2 - 12x + 4}{x} \quad x=-1 \\ ax + 2b + \frac{a}{x} &= 3x - 12 + \frac{4}{x} \Rightarrow a=3 \\ f(-1) &= 3(-1) - 4 = -7 \\ b &= -4 \end{aligned}$$

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$Df = 1-x \geq 0 \quad x \leq 1$ $Dg = (1-x)^3 > 0 \quad 1-x > 0 \quad x < 1 \quad] = \checkmark$ راهنمای کاربردی $f(x) \xrightarrow{x=2} = (-1)(\sqrt{3}) = -\sqrt{3}$ $g(x) \xrightarrow{x=2} = -\sqrt{\frac{(1+2)^2}{3}} = -\sqrt{3} = -\sqrt{3}$ نقطه‌های بحرانی $f'(x) = (x-1)\sqrt{1-x}$ $g'(x) = -\sqrt{(1-x)^3} = - 1-x \sqrt{1-x}$ در $x=0$ و $x=1$ مشتق صفر است نقطه بحرانی: $x=1$ و $x=0$	6
$Df: x \geq 0$ $Dg: x^3 > 0 \quad x > 0 \quad] = \checkmark$ $g(x) = \sqrt{x^3} = x \sqrt{x} \quad x \sqrt{x}$ در $x=0$ و $x=1$ مشتق صفر است نقطه بحرانی: $x=0$ و $x=1$	7
$Df = x \geq 0$ $Dg: x - x \geq 0 \quad x \geq 0 \quad] = \checkmark$ $g(x) = \sqrt{x - x } \rightarrow x = x \rightarrow x = 0$ $f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \rightarrow x = 0$ نقطه بحرانی: $x=0$	8
$f: \{(1,2) (2,3) (3,1) (0,0)\}$ $g: \{(1,1) (2,3) (3,0) (0,2)\}$ الف) $\frac{2+1}{2-1} = 3$ ب) $\frac{4}{0}$ (تجزیه نشد) ج) $0 \times 1 = 0$	9
$3x-1=2 \quad 3x-1=-1 \quad 3x-1=0 \quad 3x-1=-2 \quad 3x-1=3$ $x=1 \quad x=0 \quad x=\frac{1}{3} \quad x=-\frac{1}{3} \quad x=\frac{4}{3}$ $g(x) = \left\{ (1,1) (0,4) \left(\frac{1}{3}, 0\right) \left(-\frac{1}{3}, 2\right) \left(\frac{4}{3}, -1\right) \right\}$ ب) $x =2 \quad x =-1 \quad x =0 \quad x =-2 \quad x =3$ $h(x) = \{(2,1) (0,0) (3,-1)\}$	10