

۱۷، ۷۵

$$f(5) \rightarrow 5 > 1 \Rightarrow (a+1)(x+2) \Rightarrow (a+1)(7)$$

$$f(-2) \rightarrow -2 \leq 1 \Rightarrow 3a + 2x \Rightarrow 3a - 2$$

$$2f(5) = f(-2) + a$$

$$\Rightarrow 2(7(a+1) \times 2 = 3a - 2 + a$$

$$2(7a + 7) = 4a - 2$$

$$14a + 14 = 4a - 2$$

$$10a = -16 \Rightarrow a = -\frac{16}{10} = -\frac{8}{5}$$

جواب نهایی

$$(2-\sqrt{3})(2+\sqrt{3}) = 4-3 = 1 \Rightarrow \text{تقریباً معکوس}$$

$$\sqrt{A \pm \sqrt{B}} = \sqrt{\frac{A+C}{2}} \pm \sqrt{\frac{A-C}{2}}$$

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

جواب نهایی $\rightarrow 2\sqrt{4} + 4$

$$C = \sqrt{A^2 - B}$$

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

$$= \sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}} + \sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}} = 2(\sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}})$$

$$2 + \sqrt{3} + 2 - \sqrt{3} + 2(1) = 4 \rightarrow \sqrt{4}$$

$$2f(x) - 3f(-x) = 5x^2 - x$$

$$\rightarrow x \rightarrow 1-x$$

$$2f(-x) - 3f(x) = 5(-x)^2 - (-x) = 5x^2 + x$$

$$2f(x) - 3f(-x) \xrightarrow{x^2} 5f(x) - 4f(-x) = 18x^2 - 2x$$

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

$$-5f(x) = 20x^2 + x$$

$$f(x) = -\frac{4}{5}x^2 - \frac{1}{5}x$$

جواب نهایی

$$x=0 \Rightarrow (0+2)f(0) - 3(0)f(0+2) = 5(0)^2 - m(0) + 2m$$

$$2f(0) - 0 = 2m \Rightarrow f(0) = \frac{2m}{2}$$

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

$$x=-2 \Rightarrow (-2+2)f(-2) - 3(-2)f(-2+2) = 5(-2)^2 - m(-2) + 2m$$

$$0 - 4f(0) = 14 + 2m + 2m$$

$$-4f(0) = 14 + 4m$$

$$\frac{2m}{2} - 4m = 14 + 4m$$

$$-14m = 14 \rightarrow m = -\frac{14}{14} = -1$$

$$f(x) = ax + b$$

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

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

$$b = -4$$

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

$$f(-1) = -2 - 4 = -6$$

جواب نهایی

$$1-x \geq 0 \Rightarrow x \leq 1 \quad : f \text{ دامنه}$$

$$1-x \geq 0 \Rightarrow x \leq 1 \quad : g \text{ دامنه}$$

$$g(x) = -\sqrt{(1-x)^2 x(1-x)} = -\sqrt{(1-x)^2} \sqrt{x(1-x)} = -|1-x| \sqrt{1-x}$$

$$|1-x| = 1-x, 1-x \geq 0 \Leftrightarrow x \leq 1 \text{ دامنه}$$

$$g(x) = -(1-x) \sqrt{1-x} = (x-1) \sqrt{1-x} \Rightarrow \text{تابع هم برابرند}$$

۶

$$۱) f(x) = x\sqrt{x} \rightarrow x \geq 0 = f \text{ دامنه}$$

$$۲) g(x) = \sqrt{x^3} \rightarrow x^3 \geq 0 \Rightarrow x \geq 0 = g \text{ دامنه}$$

$$g(x) = \sqrt{x^3 x} = |x| \sqrt{x} \xrightarrow{x \geq 0} g(x) = x\sqrt{x} \Rightarrow \text{تابع هم برابرند}$$

۷

$$x \geq 0 : f \text{ دامنه} \Rightarrow \sqrt{x} - [\sqrt{x}] \rightarrow 0 < \sqrt{x} - [\sqrt{x}] < 1$$

$$x \geq 0 : g \text{ دامنه}$$

$$g(x) = \sqrt{x - |x|} \rightarrow x \geq 0 \Rightarrow |x| = x \quad g(x) = \sqrt{x-x} = \sqrt{0} = 0, \quad x < 0 \Rightarrow |x| = -x \quad g(x) = \sqrt{x - (-x)} = \sqrt{2x}$$

$$\text{مثال} \rightarrow x = \frac{r_0}{11}$$

$$f(0, r_0) = [\sqrt{0, r_0} - [\sqrt{0, r_0}]] = [0, r_0 - 0] = 0$$

$$Dg = [0, +\infty) \quad g(x) = 0$$

$$\text{الف) } \left(\frac{f+g}{f-g} \right) (1)$$

$$f(1) = 2, g(1) = 1 \quad \frac{f(1) + g(1)}{f(1) - g(1)} = \frac{2+1}{2-1} = 3$$

$$\text{ب) } \left(\frac{f+g}{f-g} \right) (r)$$

$$g(r) = r, f(r) = r \quad \frac{r+r}{r-r} = \frac{2r}{0} \rightarrow \text{ن}$$

$$\text{ج) } f(0) g(-1)$$

$$f(0) = 0, g(-1) = 1 \quad 0 \times 1 = 0$$

۹

$$3x-1 \rightarrow f \text{ دامنه}$$

$$\{-1, 2, 1, 0\}$$

$$3x-1 = -1 \rightarrow 3x = 0 \Rightarrow x = 0 \Rightarrow g(0) = f(-1) = 3$$

$$3x-1 = 2 \rightarrow 3x = 3 \Rightarrow x = 1 \Rightarrow g(1) = f(2) = 1$$

$$3x-1 = 1 \Rightarrow 3x = 2 \Rightarrow x = \frac{2}{3} \quad g\left(\frac{2}{3}\right) = f(1) = 3$$

$$3x-1 = 0 \Rightarrow 3x = 1 \Rightarrow x = \frac{1}{3} \quad g\left(\frac{1}{3}\right) = f(0) = 0$$

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

۱۰

سوال ۱۰ صحت ب :

$$h(x) = f(|x|)$$

$$|x| \rightarrow \text{داده } f \text{ را میگیرد}$$

$$\{r, 1, 0\} = f \text{ داده}$$

$$|x| = r \Rightarrow x = r, -r$$

$$h(r) = f(r) = 1 \quad \text{و} \quad f(-r) = f(r) = 1$$

$$|x| = 1 \rightarrow x = 1, -1 \Rightarrow h(1) = f(1) = 1$$

$$h(-1) = f(1) = 1$$

$$|x| = 0 \Rightarrow x = 0$$

$$h(0) = f(0) = 0$$

$$h = \{(r, 1), (-r, 1), (1, 1), (-1, 1), (0, 0)\} \Rightarrow \text{جواب: خنای}$$