

نام و نام خانوادگی علی حسینیان پاسخنامه تشریحی تکلیف شماره ۷۰۰ کلاس پسر B

اگر $f(x) = \sqrt{x+4\sqrt{x-4}}$ و $g(x) = \sqrt{x-4\sqrt{x-4}}$ برای $x \geq 4$ داشته باشیم و $f(x) + g(x) = a + b\sqrt{x+c}$ باشد،

حاصل $\frac{a+b}{c}$ را بدست آورید.

$$\text{if } x=4 \rightarrow f(4) + g(4) = \underbrace{\sqrt{4+4\sqrt{4}}}_4 + \underbrace{\sqrt{4-4\sqrt{4}}}_0 = 4 = a + b\sqrt{4+c}$$

$$\text{if } x=13 \rightarrow f(13) + g(13) = \underbrace{\sqrt{13+4\sqrt{9}}}_5 + \underbrace{\sqrt{13-4\sqrt{9}}}_1 = 6 = a + b\sqrt{13+c}$$

$$(a + b\sqrt{13+c}) - (a + b\sqrt{4+c}) = 2$$

$$b(\sqrt{13+c} - \sqrt{4+c}) = 2$$

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$$f(x) = \frac{x+2}{x^2-4x+3} \quad g(x) = \{(2,1), (1,0), (3,5), (0,4)\}$$

$$\frac{g}{f} : \{(2, -\frac{1}{4}), (1, 0), (3, 5), (0, 4)\} \rightarrow \frac{g}{f} : \{(2, -\frac{1}{4}), (0, 4)\}$$

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$$g(x) = \{(-2,3), (1,-1), (3,2), (-1,0)\} \text{ و } f(x) = \{(1,2), (3,-1), (4,2), (-1,6)\}$$

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

ب) $f(x^2) = \{(1,2), (\sqrt{3},-1), (2,2), (-\sqrt{3},-1)\}$

ج) $2g^2(x)+1 = \{(-2,11), (1,2), (3,9), (-1,1)\}$

د) $\frac{2f}{g} = \{(1,-4), (3,-1), (-1,-4)\}$

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$$g = \{(5,1), (2,3), (-2,6), (-1,2), (3,3)\} \text{ و } f(x) = \{(2,1), (3,1), (4,9), (-2,0)\}$$

$$h = f + g \Rightarrow h = \{(2,5), (-2,9), (3,5)\}$$

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$$f = \frac{\sqrt{3x-x}}{(x-2)([x]+[-x])+1} \rightarrow 3x \geq 0 \Rightarrow x \geq 0 \quad \sqrt{3x-x} \geq 0 \quad \sqrt{3x} \geq x \rightarrow 3x \geq x^2 \rightarrow 3 \geq x \quad x \neq 0$$

$$\Rightarrow D_f = [0, 3]$$

$(x-2) = 1$

مخرج همبوت منفی است $\Rightarrow -1 \Rightarrow [x]+[-x] \neq -1 \Rightarrow x=3 \rightarrow [x]+[-x] \neq -1$

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$g(x) = \{(1, 3), (2, 2), (4, 6), (5, 1)\} \text{ , } f(x) = \sqrt{5x - x^2 - 4} \quad h(x) = \frac{f(x)}{g(x)}$ $h(x) = \left\{ \left(1, \frac{\sqrt{4}}{3}\right), (2, 1), (4, 0), (5, 0) \right\}$	٦
الف) $y = x^3 - 3x^2 + 3x \quad (x-1)^3 = x^3 + 1 + 3x - 3x^2 = x^3 - 3x^2 + 3x + 1 \Rightarrow y = (x-1)^3 + 1$ $y-1 = (x-1)^3 \Rightarrow \sqrt[3]{y-1} = x-1 \rightarrow x = \sqrt[3]{y-1} + 1 \Rightarrow R_f = \mathbb{R}$ ب) $y = \frac{1}{x^2 - 2x}$ $y = \frac{1}{(x-1)^2 - 1} \rightarrow y(x-1)^2 - y = 1$ $(x-1)^2 = \frac{1+y}{y} \rightarrow x-1 = \sqrt{\frac{1+y}{y}} \rightarrow x = \sqrt{\frac{1+y}{y}} + 1 \Rightarrow y \neq 0$ $R_f = (-\infty, -1] \cup (0, +\infty)$	٧
الف) $y = x^2 - 4x + 1 \rightarrow \min \rightarrow x_{\min} = -\frac{b}{2a} = \frac{4}{2} = 2 \Rightarrow y_{\min} = -3 \Rightarrow R_f = [-3, +\infty)$ ب) $y = -x^2 + 6x + 3 \rightarrow \max \rightarrow x_{\max} = -\frac{b}{2a} = \frac{-6}{-2} = 3 \Rightarrow y_{\max} = 12 \Rightarrow R_f = (-\infty, 12]$ ج) $y = \sqrt{x^2 - 4x - 3} \rightarrow \min \rightarrow x_{\min} = -\frac{b}{2a} = \frac{4}{2} = 2 \Rightarrow y_{\min} = -1 \Rightarrow R_f = \sqrt{[-1, +\infty)} = [0, +\infty)$ د) $y = \sqrt{6x - x^2} \rightarrow \max \rightarrow x_{\max} = -\frac{b}{2a} = \frac{-6}{-2} = 3 \Rightarrow y_{\max} = 3 \Rightarrow R_f = \sqrt{(-\infty, 9]} = [0, 3]$	٨
الف) $y = x^{\textcircled{v}} - 5x^2 + 2x + 1 \rightarrow R_f = \mathbb{R}$ ب) $y = x^{\textcircled{v}} - 6x^2 + 3x + 2 \rightarrow R_f = \mathbb{R}$ ج) $y = \sqrt{x^2 - 6x^2 + 5x + 1} \rightarrow R_f = \sqrt{\mathbb{R}} = [0, +\infty)$ د) $y = (x^5 - 4x^2 + 3x + 1)^2 \rightarrow R_f = \mathbb{R}^+ = [0, +\infty)$	٩
الف) $y = \frac{3x+1}{x-2} \rightarrow R_f = \mathbb{R} - \left\{\frac{a}{c}\right\} = \mathbb{R} - \{2\}$ ب) $y = \frac{2x+1}{x+1} \rightarrow R_f = \mathbb{R} - \{2\}$	١٠