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تکلیف ۱۷ کرده دهم (A) دفتر

« بنام خدا »

برای حل محتوی

۱ $y = \sqrt{x f(x)} \rightarrow x f(x) \geq 0 \rightarrow$ x و $f(x)$ باید هم علامت باشند.

$D_f = [-5, 0] \cup [2, 5]$

جدول تعیین علامت ؟

۲ $y = \sqrt{\frac{-x}{f(x)}} \rightarrow \frac{-x}{f(x)} \geq 0 \rightarrow$ x و $f(x)$ باید مختلف علامت باشند.

$D_f = (-2, 2) \rightarrow$ جدول تعیین علامت ؟

۳ $f(x) = x^2 - 3x + 4 \rightarrow$ ① $x = 2 \rightarrow f(2) = 4 - 6 + 4 = 2$ $f(2) = ?$

$f(-2) = 4 + 6 + 4 = 14$ $f(2) = 2$

۴ $f(f(5)) + f(f(1)) = 9$

$f(1) = 5 \rightarrow f(5) = 2 \rightarrow f(2) = 7$

$f(x) = \begin{cases} x\sqrt{x+4} & ; x > 2 \\ 2x+2 & ; x \leq 2 \end{cases}$

۵ $f(x+1) - f(x) = 4x+2 \rightarrow a(x+1)^2 - b(x+1) + 2 - ax^2 + bx + 2 = 4x+2$

$ax^2 - 2ax + a - bx + b - ax^2 + bx = 4x+2 \rightarrow -2ax = 4x \rightarrow a = -2$

$a+b=2 \rightarrow b-2=2 \rightarrow b=4$ $a-b = -2-4 = -6$

۶ $f(x) = \frac{x^2 + 4x + 5}{x^2 + 4x + 7} = \frac{(x+2)^2 + 1}{(x+2)^2 + 3} \rightarrow f(\sqrt{3}-2) = \frac{(\sqrt{3}-2+2)^2 + 1}{(\sqrt{3}-2+2)^2 + 3} = \frac{4}{6} = \frac{2}{3}$

۷ $f(x - \frac{1}{x}) = \frac{x^2 + 1}{x^2} = (x - \frac{1}{x})^2 + 2$ $(x - \frac{1}{x})^2 = x^2 + \frac{1}{x^2} - 2 = \frac{x^2 + 1}{x^2} - 2$

$f(-3) = (-3)^2 + 2 = 11$ $\rightarrow \frac{x^2 + 1}{x^2} = (x - \frac{1}{x})^2 + 2$

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$$g(x) = \sqrt{9-x^2} \rightarrow 9-x^2 \geq 0 \rightarrow Dg = [-3, 3]$$

$$\text{الف) } \frac{f}{g} \quad D_{\frac{f}{g}} = Df \cap Dg - \{x \mid g(x) = 0\} \rightarrow D_{\frac{f}{g}} = \{0, 1, 2\}$$

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

$$\text{ب) } \frac{g}{f} \quad D_{\frac{g}{f}} = Df \cap Dg - \{x \mid f(x) = 0\} \rightarrow D_{\frac{g}{f}} = \{0, 1\}$$

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

$$\text{الف) } 2f(x) = \left\{ (2, 2) (3, 1) (-5, 4) (1, -4) \right\}$$

$$\text{ب) } f(x)+1 = \left\{ (2, 2) (3, 5) (-5, 3) (1, -1) \right\}$$

$$\text{ج) } 3f^2(x)+1 = \left\{ (2, 4) (3, 49) (-5, 13) (1, 13) \right\}$$

$$\text{د) } f(2x) = \left\{ (1, 1) \left(\frac{3}{2}, 4\right) \left(-\frac{5}{2}, 2\right) \left(\frac{1}{2}, -2\right) \right\}$$

$$f^2(x) = \left\{ (2, 1) (3, 16) (-5, 4) (1, 4) \right\} \rightarrow 3f^2(x) = \left\{ (2, 3) (3, 48) (-5, 12) (1, 12) \right\}$$

$$\text{الف) } f-g \quad D_{f-g} = \{1, 2, 3\}$$

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

$$\text{ب) } \frac{2f}{g} \quad D_{\frac{2f}{g}} = Df \cap Dg - \{x \mid g(x) = 0\} = \{1, 2, 3\} - \{1\} = \{2, 3\}$$

$$\frac{2f}{g} = \left\{ (2, 4) (3, -2) \right\} \quad \text{Parya Gohmohammadi:}$$