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نام و نام خانوادگی ....علی.... پاسخنامه تشریحی تکلیف شماره ...۵... کلاس ...یازدهم تجربی...

۱ (۲)

$f(x) = \left(\frac{1}{2}\right)^{x-2} - 1 \rightarrow y = \sqrt{x^3 f(x+1)} \rightarrow x^3 f(x+1) \geq 0$

$\rightarrow x^3\left(\left(\frac{1}{2}\right)^{x-1} - 1\right) \geq 0 \rightarrow \begin{array}{ccccc} & 0 & & 1 & \\ - & \phi & + & \phi & - \end{array} \rightarrow D_f = [0,1]$ ✓

۲ (۲)

$f(x) = \sqrt{x+|x+2|} \rightarrow f(-x) = \sqrt{-x+|2-x|}$

$\rightarrow -x+|2-x| \geq 0$

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$-x-x+2 \geq 0$	$-x+x-2 \geq 0$
$-2x \geq -2$	$-2 \geq 0$
$x \leq 1$ ✓	✗

$\rightarrow D_f = (-\infty, 1]$ ✓

۳ (۲)

$y = \sqrt{\frac{x-1}{f(x)}} \rightarrow \frac{x-1}{f(x)} \geq 0 \rightarrow$

$\begin{array}{cccccccccc} & -5 & & -4 & & 1 & & 2 & & 3 \\ | & - & \phi & + & \phi & - & \phi & + & \phi & \end{array}$

$f(x)$ تعریف نمی‌شود — $f(x)$ تعریف نمی‌شود

$\rightarrow D_f = (-4, 1] \cup (2, 3)$ ✓

۴ (۲)

$y_1 = \frac{1}{9x^4 - 7x^2 - 4x - 3} \rightarrow 9x^4 - 7x^2 - 4x - 3 = 0$

$\rightarrow 9x^4 + 3x^3 + 3x^2 - 3x^3 - x^2 - x - 9x^2 - 3x - 3 = 0$

$y_2 = \frac{1}{3x^2+ax+b}$

$3x^2(3x^2+x+1) - x(3x^2+x+1) - 3(3x^2+x+1) = 0$

$\rightarrow (3x^2-x-3)\underbrace{(3x^2+x+1)}_{\text{ریشه ندارد}} = 0$

$\rightarrow 3x^2+ax+b = 3x^2-x-3 \rightarrow a=-1 \quad b=-3 \rightarrow \sqrt{-(a+b)} = 2$ ✓

۵ (۲)

$f(x) = x^3+x \rightarrow y = \sqrt{f(x) - f\left(\frac{4}{x}\right)} \rightarrow f(x) - f\left(\frac{4}{x}\right) \geq 0$

$\rightarrow x^3 + x - \frac{64}{x^3} - \frac{4}{x} \geq 0 \rightarrow \frac{(x^6-64)+(x^4-4x^2)}{x^3} \geq 0 \rightarrow \frac{(x^3-8)(x^3+8)+x^2(x^2-4)}{x^3} \geq 0$

$\frac{(x-2)(x+2)(x^2+2x+4)(x^2-2x+4)+(x-2)(x+2)x^2}{x^3} \geq 0 \rightarrow \frac{(x-2)(x+2)(x^4+5x^2+16)}{x^3} \geq 0$

$\begin{array}{ccccccc} & -2 & & 0 & & 2 & \\ - & \phi & + & \nexists & - & \phi & + \end{array} \rightarrow D_f = [-2, 0) \cup [2, +\infty)$ ✓

$f_{(x^3+x)} = 2x^2 - 1$ $\left.\begin{array}{l} x=1 \longrightarrow f_{(2)} = 1 \\ x=2 \longrightarrow f_{(10)} = 7 \end{array}\right\} \rightarrow f_{(2)} + f_{(10)} = 8$	2	۶
$f_{(x)} = x^3 - 6x^2 + 12x \longrightarrow f_{(x)} = (x-2)^3 + 8$ $g_{(x)} = x^3 + 9x^2 + 27x \longrightarrow g_{(x)} = (x+3)^3 - 27$ $\rightarrow \dfrac{g(\sqrt[3]{7} - 3)}{f(\sqrt[3]{2} + 2)} = \dfrac{-20}{10} = -2$	2	۷
$f_{(x)} = \sqrt{x + 4\sqrt{x-4}} \quad g_{(x)} = \sqrt{x - 4\sqrt{x-4}} \quad f_{(x)} + g_{(x)} = a + b\sqrt{x+c}$ $\sqrt{(x-4) + 4\sqrt{x-4} + 4} + \sqrt{(x-4) - 4\sqrt{x-4} + 4} = \sqrt{(\sqrt{x-4} + 2)^2} + \sqrt{(\sqrt{x-4} - 2)^2}$ $= \lvert\sqrt{x-4} + 2\rvert + \lvert\sqrt{x-4} - 2\rvert \longrightarrow \begin{array}{c\|c} & 8 \\ \hline 4 & 2\sqrt{x-4} \end{array} \rightarrow \begin{array}{l} a = 0 \\ b = 2 \\ c = -4 \end{array}$ $\rightarrow \dfrac{a+b}{c} = -\dfrac{1}{2}$	2	۸
$f_{(x)} = \dfrac{x+2}{x^2 - 4x + 3} \quad g_{(x)} = \{(2,1),(1,0),(3,5),(0,4)\}$ $\left.\begin{array}{l} D_f = \mathbb{R} - \{1,3\} \\ D_g = \{2,1,3,0\} \end{array}\right\} \xrightarrow{\cap} D_{\frac{g}{f}} = \{0,2\} \rightarrow \dfrac{g}{f} = \{(0,6),(2,-\tfrac{1}{4})\}$	2	۹
$f_{(x)} = \{(1,2),(3,-1),(4,2),(-1,6)\} \quad g_{(x)} = \{(-2,3),(1,-1),(3,2),(-1,0)\}$ الف) $f_{(2x)} = \{(\tfrac{1}{2},2),(\tfrac{3}{2},-1),(2,2),(-\tfrac{1}{2},6)\}$ ب) $f_{(x^2)} = \{(1,2),(-1,2),(\sqrt{3},-1),(-\sqrt{3},-1),(2,2),(-2,2)\}$ ج) $2g^2(x) + 1 = \{(-2,19),(1,3),(3,9),(-1,1)\}$ د) $\dfrac{2f}{g} = \{(1,-4),(3,-1)\}$	2	۱۰