آیلا میرونیا

۱. چون تابع ثابت است پس باید x^2 و x داشته باشیم

$\rightarrow x^2+2x+1+9x^2-6x+1+mx^2+nx+mn$

$\mathrm{I}\ 10x^2 = -mx^2 \rightarrow m = -10$

$\mathrm{II} \rightarrow -4x = -nx \rightarrow n = 4$

$\rightarrow (4, \underset{-10}{m}) = (\underset{n}{4}, p+1) \rightarrow p+1 = -10 \rightarrow p = -11$

$(\underset{p+2}{-9}, -11) = (-9, p+k) \rightarrow p+k = -1 \rightarrow -11+k = -1 \rightarrow k = 10$

$m+n+p+k \rightarrow -10+4-11+10 = -7$

۲. الف) $y = \sqrt{\dfrac{x-2}{x^4-2x^2-8}} \rightarrow \boxed{x=2}$

$x^2 = t \rightarrow t^2-2t-8=0 \rightarrow (\underset{4}{t-4})(\underset{-2}{t+2})=0$

$x^2 \rightarrow 4 \rightarrow \boxed{x=\pm 2}$

$\rightarrow -2$ غ ق

-2	$+2$	
$-$	$+$	$+$

$\rightarrow D_f = (-2, 2) \cup (2, +\infty)$

ب) $f(x) = \dfrac{2x^2+1}{4-2[-x]} \rightarrow 4-2[-x] \neq 0 \rightarrow 4 \neq 2[-x]$

$\rightarrow [-x] \neq 2 \rightarrow 2 \leq -x < 3 \rightarrow -3 < x \leq -2$

$R_f = \mathbb{R} - (-3, 2]$

آیلا فیروزنیا

۳ـ

الف) $f(x) = \dfrac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}} \rightarrow x(x^2-1) \geq 0$

$x(x+1)(x-1) \geq 0$

	-1		0		1	
−		+		−		+

$\rightarrow [-1,0] \cup [1,+\infty)$

$|x|+x > 0 \rightarrow$

	0	
0		2x

$\rightarrow x > 0$

$D_f = [1,+\infty)$

ب) $f(x) = \dfrac{\sqrt{|x-2|-x^2}}{|x|-1} \rightarrow x \neq \pm 1$

	2	
$-x^2-x+2$		$-x^2+x-2$
ریشه ها		همواره منفی

$\rightarrow 1,\ -2 \ \left(\dfrac{c}{a}\right)$

	-2		1	
−		+		−

$\rightarrow [-2,1]$

$D_f = [-2,1] - \{-1,1\}$

۴ـ $y = \dfrac{1}{||x-2|-1|-k}$ ، $||x-2|-1|-k \neq 0 \rightarrow ||x-2|-1| \neq k$

$|x-2| = t \rightarrow t-1 = k \rightarrow t = k+1$

$\rightarrow 1-t = k \rightarrow t = 1-k$

برای اینکه ۲ مجانب داشته باشیم یکی از t ها باید صفر باشد.

I) $k+1 = 0 \rightarrow k = -1$ غ ق ق

II) $1-k = 0 \rightarrow \boxed{k = 1}$

آیلا فیروزنیا

5.

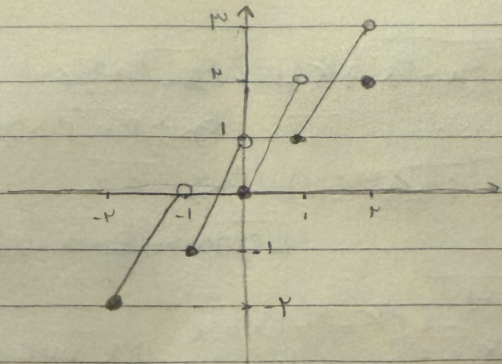
$\to -2 \le x < -1 \to 2x+2$

$-1 \le x < 0 \to 2x+1$

$0 \le x < 1 \to 2x$

$1 \le x < 2 \to 2x-1$

$x = 2 \to 2$



6.

$$\frac{x^2-4x+3}{x+a}+b=x \to \frac{x^2-4x+3}{x+a}+b-x=0$$

$$\to \frac{\cancel{x^2}-4x+3+bx+ba-\cancel{x^2}-xa}{\underbrace{x+a}_{\neq 0}}=0$$

$$-4x+3+bx+bx-xa=0 \to ba=-3$$

$$\to bx-xa=-4x \to x(b-a)=-4\cancel{x}$$

$$b-a=-4 \to \boxed{a-b=4}$$

7.

$$\text{if } x=0 \to \frac{x^3+2x^2-x-2}{x^2-1}=x+c \to 2=0+c \to \boxed{c=2}$$

$$\text{if } x=1 \to \frac{a+2}{1+b}=3 \to a+2=3+3b \to 3b-a=-1$$

$$\text{if } x=-1 \to \frac{-a+2}{-1+b}=1 \to -a+2=-1+b \to b+a=3$$

$$4b=2 \to b=\frac{1}{2}$$

$$b+c=2+\frac{1}{2}=\boxed{\frac{5}{2}}$$

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آیلا فروردینا

۸. $f(x) = \sqrt{4x - 3a} + k - 1 \rightarrow 4x - 3a \geq 0$

$4x \geq 3a \rightarrow x \geq \frac{3a}{4} \rightarrow \frac{3a}{4} = 1 \rightarrow a = \frac{4}{3}$

$g(x) = \sqrt{b - 4x} + 3k \rightarrow b - 4x \geq 0$ چون نقطه ۱ در دو مورد مشترکه.

$b \geq 4x \rightarrow \frac{b}{4} = x \rightarrow \frac{b}{4} = 1 \rightarrow b = 4$

$f(1) = k - 1$

$g(1) = 3k \xrightarrow{} 2k - 2 - 3k = k$

$-k - 2 = k \rightarrow 2k = -2 \rightarrow k = -1$

$3a - \frac{b}{2} - k = 4 - 2 - (-1) = \boxed{3}$

۹. $m = 7 \rightarrow D_f = (-\infty, 7]$

$f(x) = \sqrt{m - x} + n \qquad f \times g = (\sqrt{m - x} + n)(2x - 2)$

$g(x) = \sqrt{2x + 2} \rightarrow 2x + 2 \geq 0 \rightarrow 2x \geq -2 \rightarrow x \geq -1 \qquad D_{f \times g} = [-1, 7]$

$f(3) = \sqrt{7 - 3} + n \rightarrow 2 + n \qquad D_g = [-1, +\infty)$ $\quad m = 7$

$g(3) = \sqrt{6 + 2} = \sqrt{8} = 2\sqrt{2}$

$f(3) - g(3) = 6\sqrt{2}$

$2 + n - 2\sqrt{2} = 6\sqrt{2} \rightarrow 2 + n = 8\sqrt{2} \rightarrow n = 8\sqrt{2} - 2$

$m + n = 8\sqrt{2} - 2 + 7 = \boxed{8\sqrt{2} + 5}$

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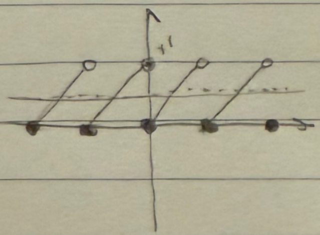
آیلا فردونیا

$y=\underbrace{(-1)^{2}}_{1}(x-[x])=\frac{1}{2} \to x-[x]=\frac{1}{2}$ -۱۵



۴ جواب