تکلیف شماره ۲ | تولید امینی

۱۷/۷۵

۱/۲۵

الف) $\left(2\left(\frac{x}{2}\right)-2\left[\frac{x}{2}\right]\right)^2$

$\left(2\left(\frac{x}{2}-\left[\frac{x}{2}\right]\right)\right)^2 \to 0 \le \ldots < 1$

$\underbrace{\frac{x}{2}-\left[\frac{x}{2}\right]}_{0 \le \ldots < 1}$

$0 \le \ldots < 2 \to$ توان ۲ $[0, 4)$

ب) $\log_{10} y = \sin x + 3 \to y = 10^{\sin x + 3}$

$-1 \le \sin x \le 1$

$10^2 \le y \le 10^4$

$R_f = [10^2, 10^4]$

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الف) $f(x) = f(-x) \to$ فقط اعداد مثبت دامنه رابررسی می‌کنیم

$x = 0 \to \frac{2}{3}$

$x = 2 \to 0$

$x \to 2^+ \to +\infty$

$x \to +\infty \to 1$

$R = [0, \frac{2}{3}) \cup (1, +\infty)$

$a+b+c = 0 + \frac{2}{3} + 1 = \frac{5}{3}$

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الف) $f(x) = x + \frac{1}{x} + 2\sqrt{x + \frac{1}{x}}$

$\sqrt{x+\frac{1}{x}} \ge 0$

$at^2 + bt + c \to$

$\to \infty \to \infty$

$\to 1 \to 2 + 2\sqrt{2}$

$\to -\frac{b}{2a} = -\frac{1}{2}$ جای نمی‌گیرد

$R_f = [2+2\sqrt{2}, +\infty)$

ب) $(3 - \sin x)(1 + \sin x) = -\sin^2 x + 2\sin x + 3$

$\sin x = -1 \to -(1) + 2(-1) + 3 = 0$

$\sin x = 1 \to -(1) + 2 + 3 = 4$

$\sin x = \frac{-b}{a} = \frac{-2}{-2} = 1$

$R = [0, 4]$

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x	1	2	3	4	...	9
$f(x)$	$\frac{29}{3}$	$\frac{28}{3}$	$\frac{27}{3}$	$\frac{26}{3}$	...	$\frac{21}{3}$

$S = \left(\frac{29}{3} + \frac{21}{3}\right) \times \frac{9}{2} = \frac{50}{3} \times \frac{3}{2} = 25$

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$a = 0, b \neq 0, f(2) = 0 \to \sqrt{2b + c} = 0 \to 2b + c = 0$

$f(3) = 1 \to \sqrt{3b + c} = 1 \to 3b + c = 1$

$\to b = 1, c = -2$

$g(x) = \sqrt{x^2 + 0(x) + (-2)} \to g(x) = \sqrt{x^2 - 2}$

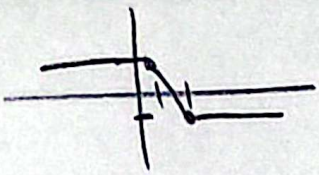
$g(x) = \sqrt{x^2 + c}$

$D_g = (-\infty, -\sqrt{2}] \cup [\sqrt{2}, +\infty)$

$R_g = [0, +\infty)$

$|x-2|-|x-1|=kx$

$x=2$ $x=1$



$kx=f(x)$

$f(0)=0$
$f(2)=1 \rightarrow \frac{1}{2}x \rightarrow k=\frac{1}{2}$ ✓

۶- ج

۷- ب

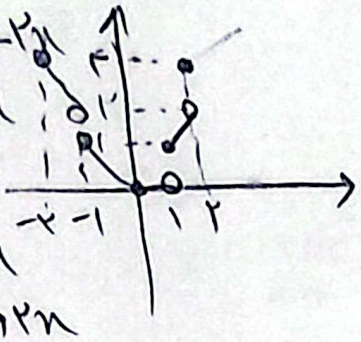
الف) $-2x<-1 \rightarrow -2x$

$-1\le x<0 \rightarrow -x$

$0\le x<1 \rightarrow 0$

$1\le x<2 \rightarrow x$

$x=2 \rightarrow 2x$

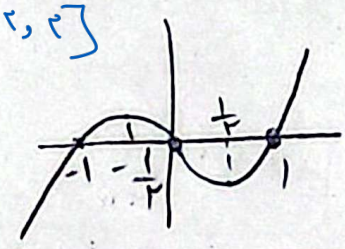


$Ry=[0,3]-\{2\}$

ب) $x\ge 0 \rightarrow x^2-x$

$x<0 \rightarrow -x^2-x \rightarrow -(x^2+x)$

$Ry=[-2,2]$



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۸- ج

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

$R=R-\{0,-1\} \rightarrow a+b=-2$ ✓

۹- ج

$\frac{(\sqrt{x}-2)(\sqrt{x}-1)}{(\sqrt{x}-1)(\sqrt{x}-1)} \xrightarrow{\sqrt{x}\neq 1} \frac{\sqrt{x}-2}{\sqrt{x}-1}$

$\min \square = 0$
$\max \square = +\infty$
مخرج ریشه دارد

$\Rightarrow (-\infty,1)\cup[2,+\infty)$ ✓

۱۰- ج

$\frac{(x-1)(x^2+2x+2)}{(x-1)(x+1)}=\frac{(x-1)(x+1)(x+2)}{(x-1)(x+1)} \xrightarrow{x\neq \pm 1} x+2 \rightarrow R_f=R-\{1,2\}$ ✓

جواب

نوید امینی