نام و نام خانوادگی ...آرین کریمی...... پاسخنامه تشریحی تکلیف شماره ...۴... کلاس ....

۱

الف) $y = \left(2\left(\frac{x}{2}\right) - 2\left[\frac{x}{2}\right]\right)^2 \to \frac{x}{2}=a \to (2(\underbrace{a-[a]}_{[0,1)}))^2 \to R_y \in [0,4)$

ب) $\underbrace{\sin x}_{[-1,1]} + 4 = \log y \to \log y \in [3,5] \to R_y \in [10^3, 10^5]$

۲

$f(x) = \sqrt{\frac{x^2-4}{x^2-9}} \xrightarrow{x^2=t} \sqrt{\frac{t-4}{t-9}} \to$ هموگرافیک $\to R-\{\frac{a}{c}\} \to R-\{1\}$

$R_f \in [0,1) \cup (1,+\infty)$ ← که زیر رادیکال

۳

الف) $f(x) = \underbrace{x+\frac{1}{x}} + 2\underbrace{\sqrt{x+\frac{1}{x}}}_{[\sqrt{2},+\infty)} \to x+\frac{1}{x} \in (-\infty,-2] \cup [2,+\infty)$ $\Big\}$ $R_f \in [2+2\sqrt{2},+\infty)$

$x>0 \leftarrow [2,+\infty)$

ب) $y = -\sin^2 x + 2\sin x + 3$ $\begin{cases} -1 \to 0 \\ 1 \to 4 \end{cases}$ $\Big\}$ $R_y \in [0,4]$

۴

$f(x) = -\frac{1}{3}x+10$, $D_f\{x \mid x \in N, x<10\}$

$1 \to \frac{29}{3}$

$2 \to \frac{28}{3}$

$3 \to \frac{27}{3} = 9$

$\vdots$

$9 \to \frac{21}{3} = 7$

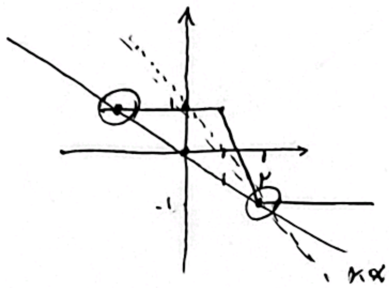
$\frac{\left(\frac{29}{3}+\frac{21}{3}\right) \times 9}{2} = 75$

۵

$f(x) = \sqrt{ax^2+bx+c} = \sqrt{x-2} \to a=0 , b=1 , c=-2$

$\to \sqrt{3-2} = \sqrt{1} = 1$

$\to g(x) = \sqrt{x^2+4} \to R_g \in [2,+\infty)$

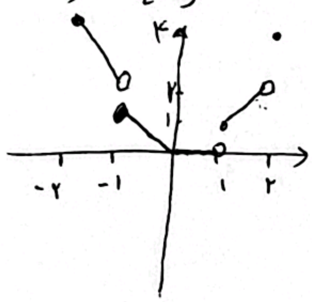


$\to kx \to 2 \to -1 \rightsquigarrow kx = -\frac{1}{2}x$

$\boxed{k = -\frac{1}{2}}$

، $kx \to$ از مبدأ می‌گذرد ۶

الف) $x[x]$



$[-2,-1) \to -2x$

$[-1,0) \to -x$

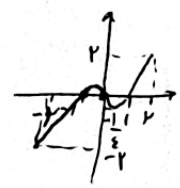
$[0,1) \to 0$

$[1,2) \to x$

$\{2\} \to 4$

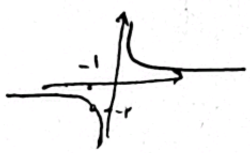
$R \in [0,4] - \{2\}$

ب) $x|x| - x \to \overset{0}{-(x^2+x) \mid x^2 - x}$



$R \in [-2,2]$ ۷

$y = \frac{1}{x} + \frac{1}{x+1} + \frac{1}{x^2+x} = \frac{x+x+1+1}{x^2+x} = \frac{2(x+1)}{x(x+1)} = 2\left(\frac{1}{x}\right)$

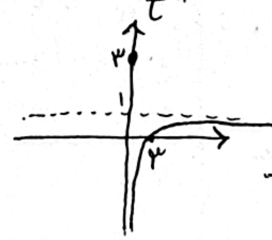


$R \in \mathbb{R} - \{-2, 0\} \to -2+0 = -2$ ۸

$f(x) = \frac{(\sqrt{x}-2)^2-1}{(\sqrt{x}-1)^2} \xrightarrow{\sqrt{x}-1=t} \frac{(t-1)^2-1}{t^2} = \frac{\overset{t(t-2)}{t^2-2t}}{t^2} = \frac{t-2}{t}$

$\xrightarrow{x=0} f(0) = 3$

$\frac{\sqrt{x}-3}{\sqrt{x}} \xrightarrow{x>0}$ همگرایند $\xrightarrow{\sqrt{x}=a} \frac{a-3}{a} \to$



$\to R_f \in (-\infty, 1) \cup \{3\}$ ۹

$f(x) = \frac{\cancel{(x-1)}\cancel{(x+1)}(x+2)}{\cancel{(x-1)}\cancel{(x+1)}} = x+2 \to x \neq 1, -1$

$\left.\begin{array}{l} -1 \to 1 \\ 1 \to 3 \end{array}\right\} 1+3=4$ ۱۰