Year: Month: Day: ( ) دوازدهم تجربی B تکلیف ۴ حسین پور page: ( )

۱۴۰۵ آذر

۱) الف) $y=\left(x-2\left[\frac{x}{2}\right]\right)^2 \xrightarrow{2x} \left(\frac{x}{2}-\left[\frac{x}{2}\right]\right)^2 \longrightarrow 0 \leq \frac{x}{2}-\left[\frac{x}{2}\right] < 1$ ۱/۷۵

$\times 2$ $0 \leq \frac{x}{2}-\left[\frac{x}{2}\right] < 2 \xrightarrow{\text{توان ۲}} 0 \leq \frac{x}{2}-\left[\frac{x}{2}\right] < 4 \quad R_f: [0,4)$

ب) $\log y - \sin x - 4 \quad \log y = \sin x + 4 \longrightarrow -1 \leq \sin x \leq 1 \to 3 \leq \sin x + 4 \leq 5$

$R_y = [10^3, 10^5]$ $\quad \log y$

۲) $f(x)=\sqrt{\frac{x^2-4}{x^2-9}} \quad y^2 = \frac{x^2-4}{x^2-9} \Rightarrow y^2x^2 - 9y^2 = x^2-4 \Rightarrow y^2x^2 - x^2 - 9y^2 - 4$ ۱/۷۵

$x^2(y^2-1) = 9y^2-4 \to x = \sqrt{\frac{9y^2-4}{y^2-1}} \to \frac{9y^2-4}{y^2-1} \geq 0$ $\quad -1 \quad -\frac{2}{3} \quad \frac{2}{3} \quad 1$ $\quad + \; - \; + \; - \; +$

$f(0)=\frac{2}{3} \quad f(\infty)=1$

$(-\infty,-1) \cup \left[-\frac{2}{3}, \frac{2}{3}\right] \cup (1,+\infty) \xrightarrow{\text{جذر}} \left\{0, \cancel{\sqrt{\tfrac{2}{3}}}\right] \cup (1,+\infty)$

$R_f = \left[0, \frac{2}{3}\right] \cup (1,+\infty) \quad a+b+c = \frac{5}{3}$

۴) الف) $x+\frac{1}{x}=t \longrightarrow t+2\sqrt{t} \quad t \geq 0 \quad x \neq 0 \Rightarrow t > 0$

۲

$x+\frac{1}{x} > 0 \longrightarrow x+\frac{1}{x} \geq 2$

$\min \xrightarrow[x=1]{} 2+2\sqrt{2} \quad R_f = [2+2\sqrt{2}, +\infty)$

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

$\Rightarrow y = -\sin^2 x + 2\sin x + 3$
- $\sin x = 1 \Rightarrow 4$
- $\sin x = -1 \Rightarrow 0 \quad R_f = [0,4)$
- $\sin x = 1 \Rightarrow 4$

$\frac{-b}{2a}$

۴) $D_f = \{1,2,\dots,8,9\} \quad x=1 \to y = \frac{-1}{3}+10 = \frac{29}{3} \quad x=2 \to y = \frac{28}{3}$

$x=9 \to y = -3+10 = 7 \quad x=8 \to y = \frac{22}{3}$ ۲

$R_f\left\{7, \frac{22}{3}, \frac{23}{3}, 8, \frac{25}{3}, \frac{26}{3}, 9, \frac{28}{3}, \frac{29}{3}\right\} \Rightarrow \text{جمع} = 75$

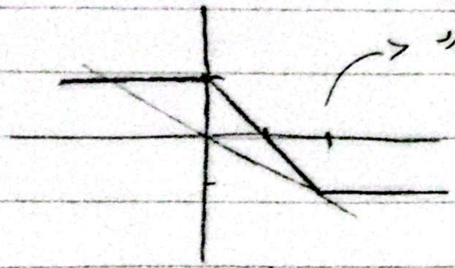
۵) $\sqrt{ax^2+bx+c} \quad a=0 \to bx+c \qquad \sqrt{x^2+4} \to R_f = [4,+\infty) \text{ جذر}$ ۲

$\frac{2}{-1\;+} \qquad \sqrt{x-2} \qquad b=1 \quad c=-2$

$[2,+\infty)$

۶) ②

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



$y = kx$

$\begin{cases} x=2 \\ y=-1 \end{cases} \Rightarrow -1 = 2k$

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

۷) ②

الف) $= x[x]$

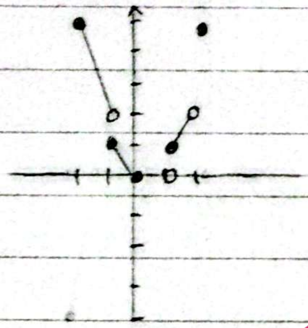
$-2\leq x<-1 \quad -2x$

$-1\leq x<0 \quad -x$

$0\leq x<1 \quad 0$

$1\leq x<2 \quad x$

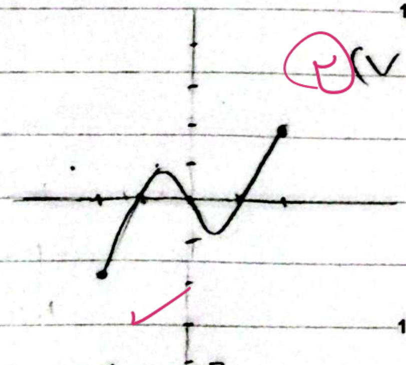
$x=2 \quad 2x$



برد: $\{0,4]-\{2\}$

ب) $x|x|-x$

$\begin{cases} x^2-x & x\geq 0 \\ -x^2-x & x<0 \end{cases}$



برد: $[-2,2]$

۸) ②

$y = \frac{1}{x}+\frac{1}{x+1}+\frac{1}{x^2+x} \Rightarrow \frac{x+1+x+1}{x^2+x} = \frac{2+2x}{x^2+x} \quad x\neq 0,-1 \quad \frac{2(1+x)}{x(1+x)}$

$y = \frac{2}{x}$ برد: $R-\{\underset{a}{0},\underset{b}{-2}\} \Rightarrow a-b \Rightarrow 0+(-2) = -2$)

۹) ②

$y = \frac{x-4\sqrt{x}+3}{x-2\sqrt{x}+1} = \frac{(\sqrt{x}-1)(\sqrt{x}-3)}{(\sqrt{x}-1)^2} \Rightarrow y = \frac{\sqrt{x}-3}{\sqrt{x}-1} \Rightarrow y\sqrt{x}-y = \sqrt{x}-3$

$(y-1)\sqrt{x} = y-3 \Rightarrow x = \sqrt{\frac{y-3}{y-1}} \quad \frac{y-3}{y-1}\geq 0 \quad \begin{matrix} & 1 & & 3 & \\ + & 0 & - & 0 & + \end{matrix} \quad R_f: (-\infty,-1)\cup[3,+\infty$

۱۰) ②

$x^3+2x^2-x-2 \;\big|\; x-1$ → x^2+3x+2

$\ominus x^3 \oplus x^2$

$3x^2-x-2$

$-3x^2+3x$

$2x-2$

$2x-2$

0

$y = \frac{(x-1)(x^2+3x+2)}{x^2-1} = \frac{\cancel{(x-1)}(x+2)\cancel{(x+1)}}{\cancel{(x+1)}\cancel{(x-1)}}$

$x\neq \pm 1$

$y\neq 1,3 \Rightarrow R_f: R-\{3,1\}$

$1+3 = 4$)