پارمیس نیازاد، دوازدهم دختر B تکلیف شماره ۵

۱) $x=1 \rightarrow 2f(2^2) = 2^2 + f(2^2) \Rightarrow f(2^2) = 2^2$

$f(2x+1) + f(x+2) = 2^2 x + 2^2$

$\rightarrow (2x+1) + (x+2) = 2^2 x + 2^2$

$f(x) = x \Rightarrow y = \sqrt{x - x^2}$

$x - x^2 \quad max = \left(\frac{1}{2}, \frac{1}{4}\right) \quad R_f = \left(-\infty, \frac{1}{4}\right]$

$\sqrt{x - x^2} \Rightarrow R_f = \left[0, \frac{1}{4}\right]$

۲) $y = \frac{x(x+2)(x-2)}{x+2} = x^2 - 2x$

$D_f = \mathbb{R} - \{a, b\} \quad R_f = [c, +\infty) - \{8\}$

$\Rightarrow f(a) = f(b) = 8$

$x^2 - 2x = 8 \quad x^2 - 2x - 8 = 0 \quad (x-4)(x+2) = 0$

$a = 4 \quad b = -2 \quad c = min = -1$

$f\left(\frac{a+b}{2c}\right) = f\left(\frac{2}{-2}\right) = f(-1) = (-1)^2 - 2(-1) = 3$

۳) $y = \sqrt[3]{(x-2)^3} \Rightarrow a = -6 \quad b = 12$

$y = (x-2)$

$D_f = [-6, +12]$

$R_f = [(-6-2), (12-2)] = [-8, 10]$

۴) $y = \left(\frac{x+1}{1-x}\right)^{\frac{1}{5}}$ $\xrightarrow{a^x \quad a>0}$ $\frac{x+1}{1-x} > 0$

	-1		1	
	−	۰	+	∄	−

$x = (-1, 1)$

$y = \frac{ax^2-1}{x^2+b}$ $\begin{cases} x^2 = 0 \to y = \frac{-1}{b} \\ x^2 = +\infty \to y = a \end{cases}$

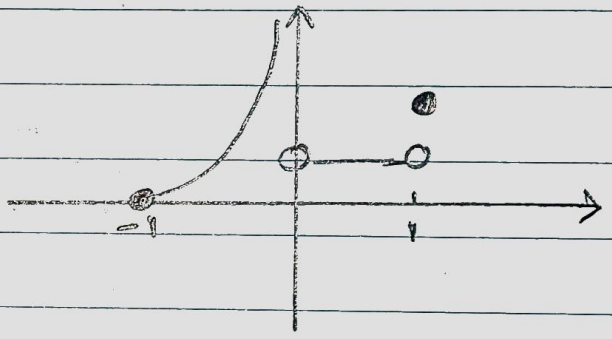
بازای $b<0$ مخرج صفر می‌شود $\to$ $b = 1$ یا -1 $\quad a = 1$ یا -1

$a = -1 \quad b = -1 \quad a+b = -2$

۵) $[-1, 0) \to \frac{-1-x}{x}$

$(0, 1) \to 0 + 1 = 1$

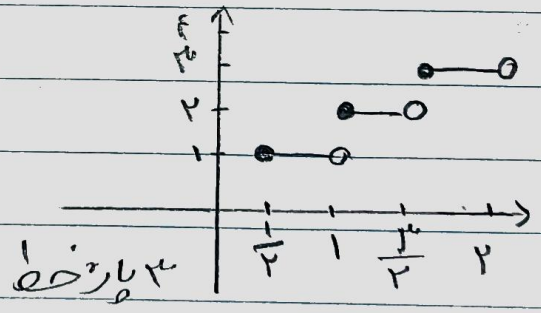
$\{1\} \to 2$



۶) $[\frac{1}{2}, 1) \to 0 + 1 = 1$

$[1, 1.5) \to 1 + 1 = 2$

$[1.5, 2) \to 1 + 2 = 3$



۳ پاره خط

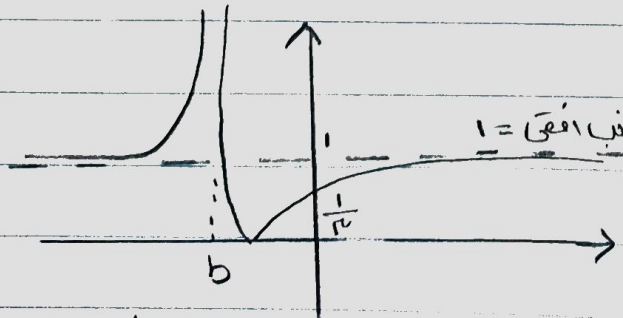
۷) مجانب افقی $= \frac{1}{a} = 1$

$\Rightarrow a = 1$

$f(b) = 1 \Rightarrow \left|\frac{b+1}{b+2^2}\right| = 1$

$\frac{b+1}{b+2^2} = (-1) \to b+1 = -b-2^2$

$b = -2$

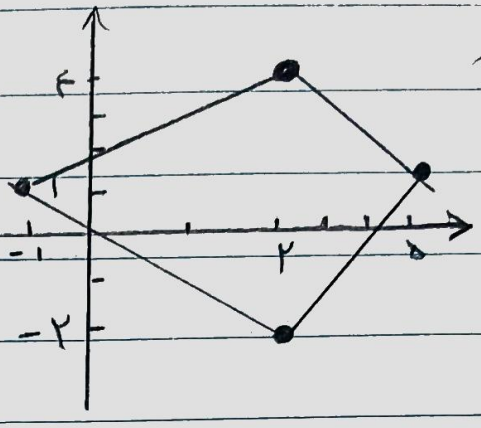


نمودار $\left|\frac{x+1}{ax+2^2}\right|$

$a - b = (1) - (-2) = 3$

y \ x	$x<2$	$x>2$
$y>1$	$y=x+2$	$y=4-x$
$y<1$	$y=-x$	$y=x-4$

۸)

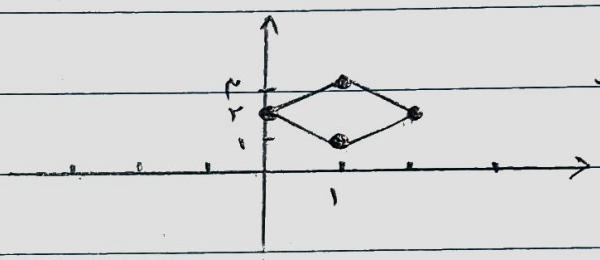


۹) الف

$|x-1|+|y-2|=1$

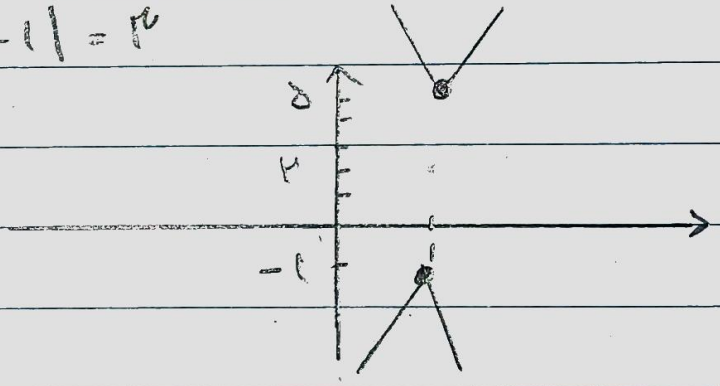
$x=1 \rightarrow y=2 \pm 1$

$y=2 \rightarrow x=2 \pm 0$



ب

$x(-1) \rightarrow |y-2|-|x-1|=2$



۱۰)

$$\begin{cases} x \geq 0 \rightarrow y=(2+a)x+b \\ x<0 \rightarrow y=(2-a)x-b \end{cases}$$

چون تابع بر R است پس شیب ها هم علامت باشند

$2+a>0 \rightarrow a>-2$ ، $2-a>0 \rightarrow a<2$

$\Rightarrow a=(-2,2)$