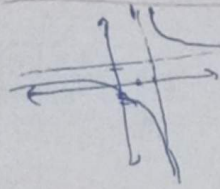
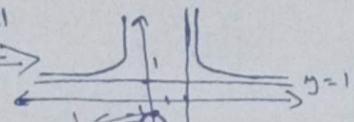


الف) $y = \frac{|x|+1}{|x|-2}$ تابع را بدون محدودیت رسم کرده و سپس نسبت به محور y ها قرین می کنیم

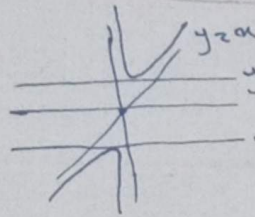


اعمال تدریسی

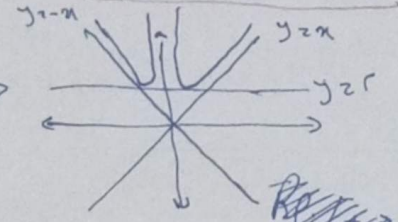


$R_f: \mathbb{R} - (-\frac{1}{2} + 1)$

نقطه $y = \frac{x^2+1}{|x|} \Rightarrow x + \frac{1}{|x|}$



اعمال تدریسی



$R_f: [2, +\infty)$

ماده تفکیک می دهیم و محدود می برای m های حقیقی را می $\frac{m}{m^2-1}$

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

$$\Delta \geq 0 \Rightarrow (y-1)^2 - 4(-2-y-2) \geq 0 \Rightarrow (y-1)^2 + 4y + 12 \geq 0 \Rightarrow (y+3)(y+4) \geq 0$$

$\Rightarrow y \in (-\infty, -4] \cup [-3, +\infty)$

$y = \frac{x^2-x+\frac{1}{x}}{x^2-x+1}$ $R_f: \mathbb{R}$ - $\frac{1}{x}$ $\Rightarrow x^2-x+1 \Rightarrow \Delta < 0 \Rightarrow$ $\Rightarrow D_f: \mathbb{R}$

$\frac{x^2-x+\frac{1}{x}}{x^2-x+1} \Rightarrow \frac{\frac{1}{x}}{1} = \frac{1}{x} \Rightarrow R_f: [0, 1)$

برای برد پیدا کردن محدود x های دهیم

الف) $y = \sqrt{-x^2+4x-1} \Rightarrow -x^2+4x-1 \xrightarrow{\text{نیمه ماکزیمم}} \text{Max}(f(x)) \rightarrow \frac{-b}{2a} \Rightarrow \frac{4}{2 \times (-1)} = -2$

$\rightarrow x=2 \rightarrow y = -4+8-1 = 3 \Rightarrow R_f: (-\infty, 3] \Rightarrow R_{\sqrt{f}}: [0, \sqrt{3}]$

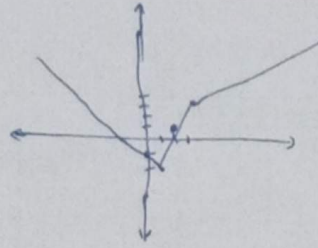
$y = \sqrt{x^2-8x} \rightarrow x^2-8x \xrightarrow{\text{نیمه مینیمم}} \text{Min}(f(x)) \rightarrow \frac{-b}{2a} \rightarrow \frac{-(-8)}{2 \times 1} = 4 \rightarrow 8-16 = -8$

$\rightarrow R_f: [-8, +\infty) \rightarrow R_{\sqrt{f}}: [-2, +\infty)$

الف) $y = \log(x^2-x+1) = \log(f(x)) \Rightarrow R_f: \mathbb{R} \xrightarrow{\text{اربعان log ها، مثبت}} \log(0, +\infty) \cup (-\infty, +\infty) = \mathbb{R}$

$y = \log\left(\frac{x+1}{x}\right) \rightarrow \frac{x+1}{x} > 0, x \neq 0 \xrightarrow{\text{نیمه مینیمم}} \frac{x+1}{x} \geq 1, R_f: [1, +\infty) \Rightarrow \log(1, +\infty) = [0, +\infty)$

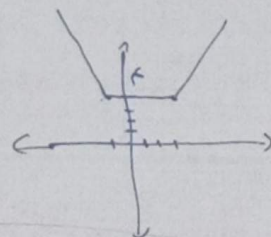
الف) $y = |m-r| - |n-r|$



$\min f(m) = -r$
 $R_f: [-r, +\infty)$

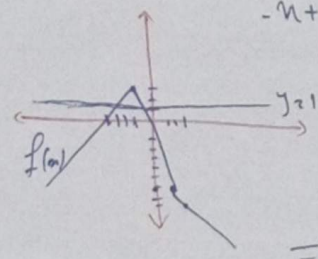
(9)

ب) $y = |n-r| + |m+1|$



$\min f(m) = +r$
 $R_f: [r, +\infty)$

$|n-r| - |m+r| \leq 1$

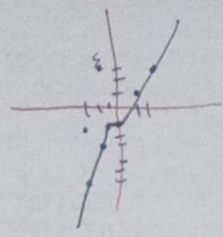


$-n+r - (-m-r) = m+r \Rightarrow m+r \leq 1$
 $m \leq 1-r$
 $-m+r - (m+r) = -2m \Rightarrow -2m \leq 1$
 $\Rightarrow m \geq -\frac{1}{2}$
 $\Rightarrow m \in (-\infty, -\frac{1}{2}) \cup [\frac{1}{2}, +\infty)$

(10)

$y = |m-r| + |m+1| + |n|$

$n \geq 1 \rightarrow y = -n$
 $n = -1 \rightarrow y = -r$
 $n = \frac{1}{r} \rightarrow y = -1$
 $n = 0 \rightarrow y = -1$

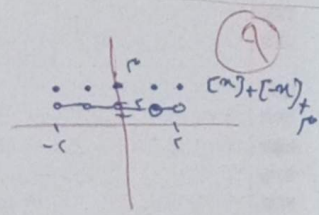
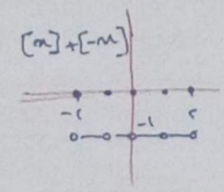


$R_f: \mathbb{R}$

(11)

الف) $y = [x] + [r-x] = [x] + [-x] + r$

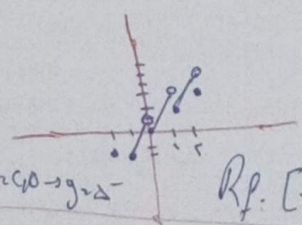
$R_f: \{r, r\}$



(12)

ب) $|m-r| - [x] = |m+n-r|$

$n = r \rightarrow y = -r$
 $n = -1 \rightarrow y = -r$
 $n = 1 \rightarrow y = -r$
 $n = \frac{1}{r} \rightarrow y = \frac{r}{r}$
 $n = 0 \rightarrow y = 0$
 $n = 1 \rightarrow y = r$
 $n = 0 \rightarrow y = -r$



$R_f: [-r, r]$

الف) $y = \sin^2 m - \sin^2 n + 1$

$R_f: [\frac{r}{r}, r]$

(13)

ب) $y = \sin^2 m + \sin^2 n + 1$