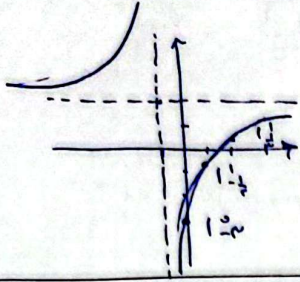
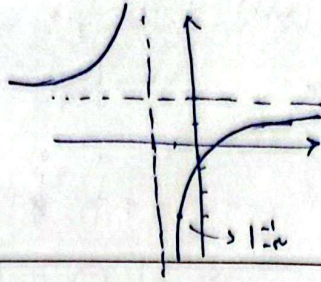


<p>الف) $y = x^3 - 3x^2 + 3x - 1 + 1$ $\rightarrow y = (x-1)^3 + 1 \rightarrow y-1 = (x-1)^3$ $\sqrt[3]{y-1} = x-1 \rightarrow \sqrt[3]{y-1} + 1 = x$ $R_f = (-\infty, +\infty)$</p>	<p>$yx^2 - 2yx = 1 \rightarrow \frac{1}{y} = x^2 - 2x + 1 - 1$ $\rightarrow \frac{1}{y} + 1 = (x-1)^2 \rightarrow \sqrt{\frac{y+1}{y}} = x-1$ $x = \sqrt{\frac{y+1}{y}} + 1$ $R_f = (-\infty, -1) \cup (0, +\infty)$</p>	1
<p>الف) $y = x^2 - 6x + 10$ $\xrightarrow{a > 0}$ $\begin{cases} x_{min} = \frac{6}{2} = 3 \\ y_{min} = 4 \end{cases}$ $R_f = [4, +\infty)$</p> <p>ب) $y = -x^2 + 9x + 10$ $\xrightarrow{a < 0}$ $\begin{cases} x_{max} = \frac{9}{-2} = -\frac{9}{2} \\ y_{max} = 12 \end{cases}$ $R_f = (-\infty, 12]$</p>	<p>ع) $y = \sqrt{x^2 - 6x - 10}$ $\xrightarrow{a > 0}$ $\begin{cases} x_{min} = \frac{6}{2} = 3 \\ y_{min} = -1 \end{cases}$ $R_f = [0, +\infty)$</p> <p>د) $y = \sqrt{4x - x^2}$ $\xrightarrow{a < 0}$ $\begin{cases} x_{max} = \frac{-4}{-2} = 2 \\ y_{max} = 2 \end{cases}$ $R_f = [0, 2]$</p>	۲
<p>الف) $y = x^2 - 8x + 2x + 1$ $R_f = \mathbb{R}$</p> <p>ب) $R_f = \mathbb{R}$</p> <p>ج) $R_f = [0, +\infty)$</p> <p>د) $R_f = \mathbb{R}$</p>		۳
<p>الف) $y = \frac{x+1}{x-2} \rightarrow R_f = \mathbb{R} - \{2\}$</p> <p>ب) $y = \frac{x+1}{x+1} \rightarrow R_f = \mathbb{R} - \{-1\}$</p>		۴
<p>الف) $y = \sqrt{\frac{x+1}{x+1}} \rightarrow R_f = [0, +\infty) - \{\sqrt{2}\}$ (ردس ۴)</p> <p>ب) $y = \sqrt{\frac{x+1}{x-2}} \rightarrow R_f = (0, +\infty)$ (ردس ۴) (توقف شده $\rightarrow -\infty$)</p>		۵

الف) $y = \frac{2n-3}{n+1}$ \rightarrow مبنای -1
 \rightarrow مبنای 2



ب) $y = \frac{2n-1}{n+2}$ \rightarrow مبنای -2
 \rightarrow مبنای 2



6

الف) $R_f = (-\infty, -2] \cup [2, +\infty)$

ب) $y = n^{\frac{1}{2}} + \frac{1}{n^{\frac{1}{2}}} \rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

ج) $y = \frac{\sqrt{n^2+1}}{\sqrt{n}} = \sqrt{n} + \frac{1}{\sqrt{n}} \rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

د) $y = \sqrt{n} + \frac{1}{\sqrt{n}} \rightarrow a > 0 \rightarrow R_f = [2, +\infty)$

7

الف) $(n^2=t) \rightarrow y = \frac{1}{t+3} + t$

$\frac{t(t+3)+1}{t+3} - \frac{1}{3} = y - \frac{1}{3}$

$\rightarrow \frac{t^2+3t+1-t-3}{t+3} = y - \frac{1}{3}$

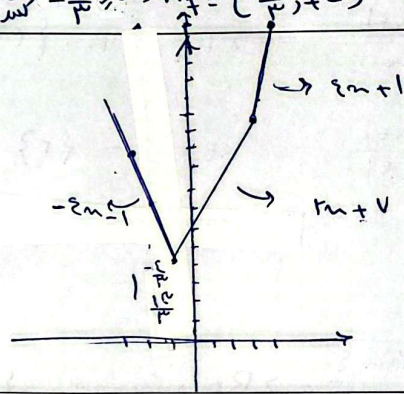
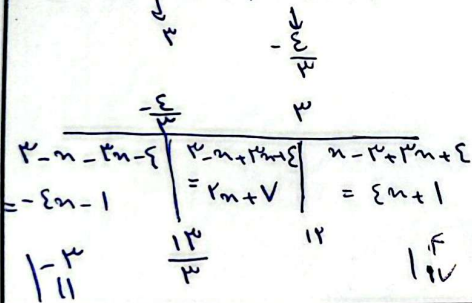
$\rightarrow y - \frac{1}{3} = \frac{t(t+2)}{(t+3)}$ $x^2 \geq 0 \rightarrow \frac{t}{t+3} \geq 0 \rightarrow \frac{t}{t+3} - \frac{1}{3} \geq 0 \rightarrow R_f = [\frac{1}{3}, +\infty)$

ب) $\sqrt{n^2+\epsilon} + \frac{1}{\sqrt{n^2+\epsilon}} \rightarrow n_{\min}^2 = 0 \rightarrow 2 + \frac{1}{2} = \frac{5}{2}$

$\sqrt{n^2+\epsilon} \geq 0 \rightarrow R_f = [\frac{5}{2}, +\infty)$

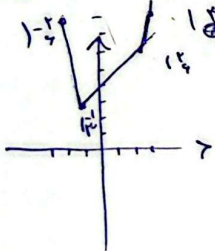
8

$y = |x-3| + |3x+2|$



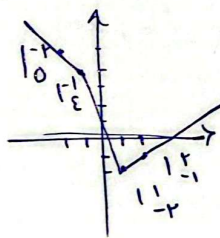
9

الف) $y = |n-2| + |2n+2|$



$R_f = [2, +\infty)$

ب) $y = |2n-2| - |n+1|$



$R_f = [-2, +\infty)$

10