

15

Cont.
B

امیر محمد فروزانی

الف) $u^3 - 3u^2 + 3u =$

$(u-1)^3 y - 1 \rightarrow u-1 = \sqrt[3]{y-1} \rightarrow u = \sqrt[3]{y-1} + 1 \rightarrow y \geq 1$

ب) $y = u^3 - 3u^2 = 1$

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

$(u+1)^3 = \frac{1}{y} + 1 \rightarrow u+1 = \sqrt[3]{\frac{1}{y} + 1} \rightarrow u = \sqrt[3]{\frac{1}{y} + 1} - 1 \rightarrow \frac{1}{y} > 1 \rightarrow y < 1$

$R = \mathbb{R} \leftarrow -1 + \sqrt[3]{y-1}$

$\frac{-1}{+3-1+}$

1, 2, 3

الف) $y = u^3 - 2u + 6 \rightarrow -\frac{b}{2a} = \frac{-(-2)}{3} = \frac{2}{3} \rightarrow \frac{2}{3} - 1 + 6 = 5 \rightarrow [5, +\infty)$ ✓

2

ب) $y = -u^3 + 7u + 3 \rightarrow -\frac{b}{2a} = \frac{-7}{-3} = \frac{7}{3} \rightarrow \frac{7}{3} - 1 + 3 = \frac{13}{3} \rightarrow (-\infty, \frac{13}{3}]$ ✓

ج) $y = \sqrt{u^3 - 2u - 3} \rightarrow -\frac{b}{2a} = \frac{-(-2)}{3} = \frac{2}{3} \rightarrow \frac{2}{3} - 1 - 3 = -\frac{11}{3} \rightarrow \sqrt{[-\frac{11}{3}, +\infty)} \rightarrow [0, +\infty)$ ✓

د) $y = \sqrt{3u - u^3} \rightarrow -\frac{b}{2a} = \frac{-3}{-2} = \frac{3}{2} \rightarrow 1.5 - 9 = -7.5 \rightarrow \sqrt{[-7.5, 9]} \rightarrow (0, 3]$ ✓

الف) $y = u^3 - 2u^2 + 2u + 1 \rightarrow \mathbb{R}$ ✓

1, 5

ب) $y = u^5 - 4u^2 + 3u + 2 \rightarrow \mathbb{R}$ ✓

ج) $y = \sqrt{u^5 - 4u^2 + 3u + 2} \rightarrow \sqrt{\mathbb{R}} \rightarrow [0, +\infty)$ ✓

د) $y = (u^5 - 4u^2 + 3u + 2)^2 \rightarrow \mathbb{R}^2 \rightarrow \mathbb{R} [0, +\infty)$

قطب‌بر + صفر

الف) $y = \frac{u+1}{u-2} \rightarrow \mathbb{R} - \{2\}$ ✓

2

ب) $y = \frac{u+1}{u+1} \rightarrow \mathbb{R} - \{1\}$ ✓

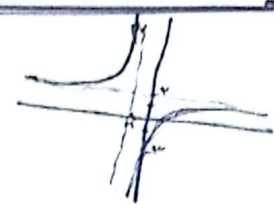
ج) $y = \sqrt{\frac{u+1}{u-2}} \rightarrow \mathbb{R} - \{2\} \rightarrow [0, +\infty) - \{\sqrt{2}\}$

1, 7, 5

د) $y = \sqrt{\frac{u+1}{u-2}} \rightarrow \mathbb{R} - \{2\} \rightarrow [0, +\infty) - \{1\} \rightarrow [0, +\infty)$ ✓

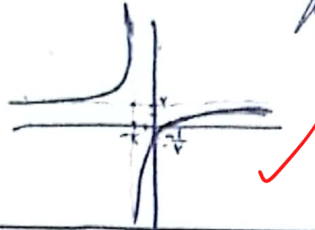
بعضی از این‌ها دامنه را در نظر بگیرید

الف) $y = \frac{2n-3}{n+1} =$ $n=1$ $y = \frac{9}{2} = 4.5$ $n=2$ $y = \frac{1}{2} = 0.5$ $n=3$ $y = \frac{-1}{4} = -0.25$



✓ (2)

ب) $y = \frac{2n-1}{n+1} =$ $n=-2$ $y = \frac{5}{-1} = -5$ $n=0$ $y = \frac{-1}{1} = -1$ $n=1$ $y = \frac{-3}{2} = -1.5$



✓

الف) $y = \frac{1}{\sin u} \rightarrow (-\infty, -2] \cup [2, +\infty)$ ✓

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

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

د) $y = \sqrt{n} + \frac{1}{\sqrt{n}} \rightarrow [2, +\infty)$ ✓

(2)

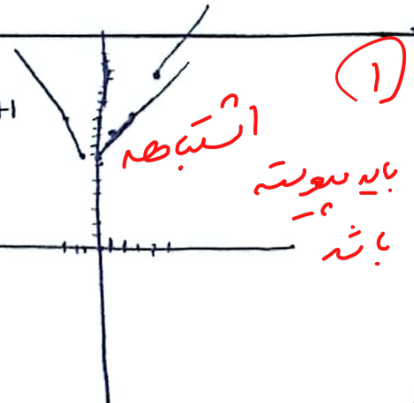
الف) $y = n^2 + \frac{1}{n^2+1} \rightarrow$ $n^2 = t \rightarrow t + \frac{1}{t+1} \rightarrow (n-1) + \frac{1}{n} \rightarrow (n+\frac{1}{n}) - 1$ $n \geq 0 \rightarrow$ $(2, +\infty)$

(2)

ب) $y = \frac{n^2+1}{\sqrt{n^2+1}} = \sqrt{n^2+1} + \frac{1}{\sqrt{n^2+1}} \rightarrow \sqrt{n^2+1} + \frac{1}{\sqrt{n^2+1}} \rightarrow$ $\min = 2$ $(2, +\infty)$

$y = |n-3| + |n+1|$

$n < -1$	$-1 < n < 3$	$n > 3$
$-n+3-n-1 = -2n+2$	$-n+3-n-1 = -2n+2$	$n-3+n+1 = 2n-2$
$y = -2n+2$	$y = -2n+2$	$y = 2n-2$
$n < -1$	$-1 < n < 3$	$n > 3$
$y = -2n+2$	$y = -2n+2$	$y = 2n-2$



(1)

استنباط
باید بیرون
باشد

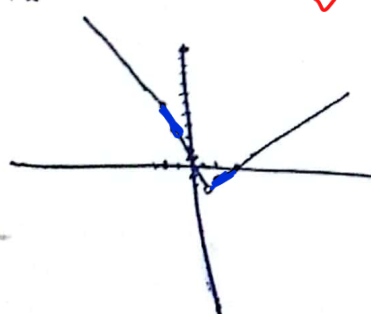
الف) $y = |n-2| + |n+2|$

ب) $y = |n-2| - |n+1|$

$n < -2$	$-2 < n < -1$	$-1 < n < 2$	$n > 2$
$-n+2-n-1 = -2n+1$	$-n+2-n-1 = -2n+1$	$-n+2-n-1 = -2n+1$	$n-2-n-1 = -n-3$
$y = -2n+1$	$y = -2n+1$	$y = -2n+1$	$y = -n-3$
$n < -2$	$-2 < n < -1$	$-1 < n < 2$	$n > 2$
$y = -2n+1$	$y = -2n+1$	$y = -2n+1$	$y = -n-3$

$y = |n-2| + |n+2|$

$n < -2$	$-2 < n < 2$	$n > 2$
$-n+2-n-2 = -2n$	$-n+2-n-2 = -2n$	$n-2+n+2 = 2n$
$y = -2n$	$y = -2n$	$y = 2n$
$n < -2$	$-2 < n < 2$	$n > 2$
$y = -2n$	$y = -2n$	$y = 2n$



$[3, +\infty)$

خوارها بیرون
هستند

(1)