

در صورتی که n فرد باشد

(1)
(1.5)

14, 15

$n > 1 \Rightarrow n^p - (n-1)^p < p n^{p-1}$ و $n^p - (n-1)^p > p n^{p-1}$ $\leftarrow$ $n \leq 0$ و $n \geq 0$

$n < 1 \Rightarrow -n^p + (n-1)^p < -p n^{p-1}$ و $n^p - (n-1)^p > p n^{p-1}$ $\rightarrow$ $n \leq 0$

✓ ب. ب.

(2)

1) $-1 < \frac{n-1}{n} < 1$

2) $-\frac{1}{n} < \frac{n-1}{n} < \frac{n-1}{n}$ (2)

II) $\frac{n-1}{n} < -\frac{1}{n}$ $\frac{-1}{n} < \frac{n-1}{n}$ $n > 0$
 $I \cap II \Rightarrow (\frac{1}{n}, \infty)$ ✓

3) $1 < \frac{n-1}{n-1} < 1$ $\frac{n-1}{n-1} < -1$

$-\frac{n-1}{n-1} < -1 \Rightarrow \frac{n-1}{n-1} < 1$
 $\frac{-1}{n-1} < -1$
 $\frac{1}{n-1} < 1$ (3)

$\frac{n-1}{n-1} < 1 \Rightarrow \frac{n-1}{n-1} < 1$
 $\frac{-1}{n-1} < 1$
 $\frac{1}{n-1} < 1$ (4)

$I \cup II \Rightarrow (-\infty, \frac{1}{n}) \cup (-\frac{1}{n}, \frac{1}{n})$ ✓

(1.5) (2)

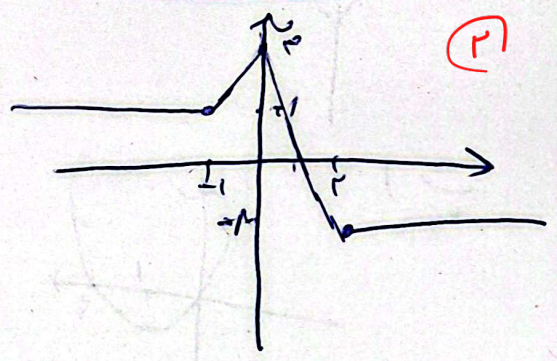
$n > -1 \Rightarrow n^p - n - 1 < 0$ $\frac{-1}{n} < \frac{n-1}{n}$ $\rightarrow$ $(-\infty, 0)$

$n < -1 \Rightarrow n^p + n - 1 < 0 \Rightarrow \frac{n-1}{n} < -\frac{1}{n}$ $\frac{-1}{n} < \frac{n-1}{n}$ $\rightarrow$ $(-\infty, -1)$
 $-1 < n < 1 \Rightarrow -\frac{1}{n} < n - \frac{1}{n} < \frac{1}{n}$ $\frac{-1}{n} < n - \frac{1}{n} < \frac{1}{n}$ $\rightarrow$ $(-\infty, -1) \cup (-1, 1)$

$n < -1$	$-1 < n < 1$	$n > 1$
$n^p + n - 1 < 0$	$n^p + n - 1 < 0$	$n^p - n - 1 < 0$

max: n
min: -1

$n - 1 \leq 0$ ✓



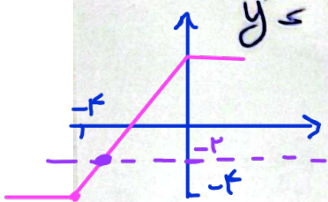
(2)

تغییرات مقدار روی خود x اجزایین

$$y = \left| \frac{1}{x} (x+4) \right| - 1$$

$$x = -5$$

(1)



$$\left| \frac{1}{x} (x+4) \right| - 1 = \left| \frac{1}{x} x \right| - 1 \xrightarrow{x^2} |x+4| - |x| = -2$$

$$-4 < x < 0$$

$$x+4+x = -2 \Rightarrow x = -3$$

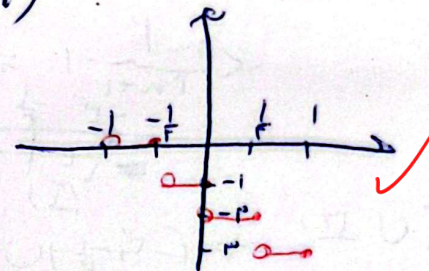
$$\begin{aligned} & \frac{1}{x} x + \frac{4}{x} - 1 = \frac{1}{x} x - 1 \\ & \frac{4}{x} - 1 = -1 \end{aligned}$$

الف) $\frac{-4}{x^2 - 1} = -1$ $[-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5]$

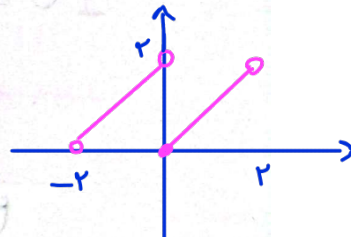
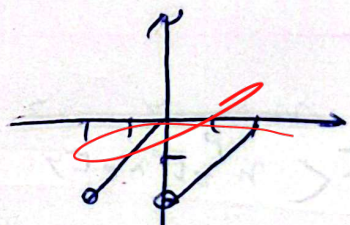
ب) $\frac{1}{x} - 1 = \left[\frac{1}{x} \right] \Rightarrow 1 - [x] - 1 \Rightarrow [-1, 0]$

الف) $y = [-x] - 1$ $x \in (-1, 1)$

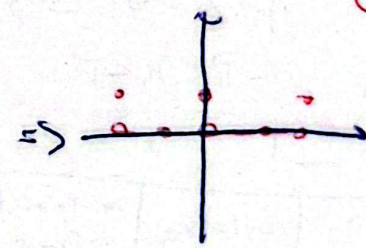
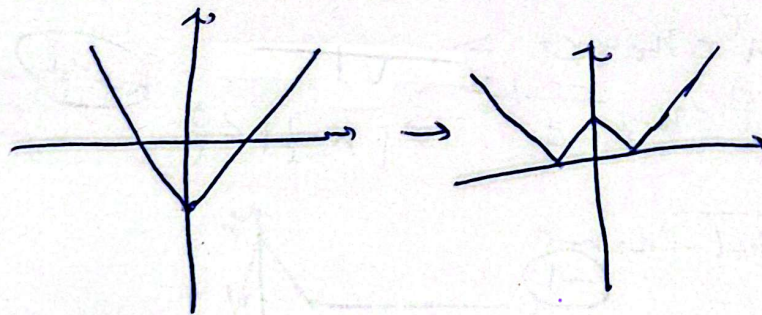
$$\begin{aligned} -1 < x \leq -\frac{1}{2} & \Rightarrow 0 \\ -\frac{1}{2} < x \leq 0 & \Rightarrow -1 \\ 0 < x \leq \frac{1}{2} & \Rightarrow -2 \\ \frac{1}{2} < x < 1 & \Rightarrow -3 \end{aligned}$$



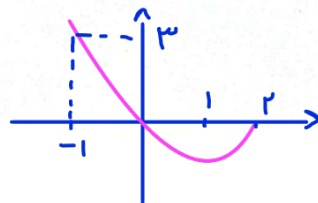
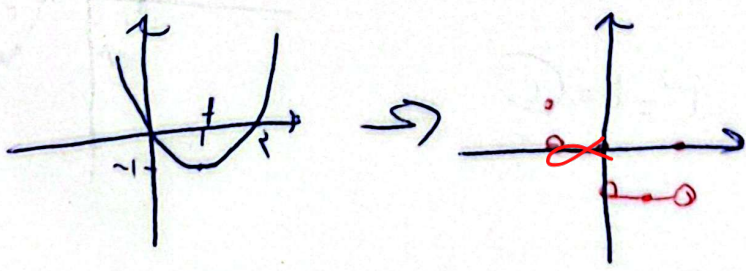
ب) $\left[\frac{x}{2} \right] - \left[\frac{x}{2} \right]$



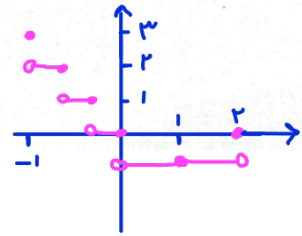
الف



ب)



برای



$$[a \cup \{b\}] \leq 4 \Rightarrow [a] \cup [b] \leq 4$$

$$[b - \{a\}] \leq 2 \Rightarrow [b] - [a] \leq 2$$

$$[a] \leq 1 \quad [b] \leq 3$$

$$a = [a] \cup \{a\} \leq 1, 2 \checkmark$$

$$b = 3 \cup \{4\} \leq 3, 4 \checkmark$$

$$a \cup b \leq 4 \quad \boxed{4, 4}$$

$$b - [a] = 2, 4 \rightarrow b = 2, 4$$

$$(1 + \sqrt{2})^4 \leq 198 - (1 - \sqrt{2})^4$$

گفته شد که می توان آن را نیز به صورتی دیگر نوشت

$$(1 + \sqrt{2})^4 \leq 198 - (1 - \sqrt{2})^4 \quad \checkmark$$