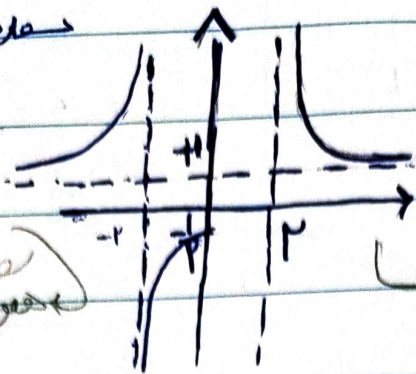


مسألة: ٥

تأليف: تزكمك نيل

$$y = \frac{|x|+1}{|x|-2}$$



$$x=0 \rightarrow y = -\frac{1}{2}$$

①

$$R_y = R - (-\frac{1}{2}, 1]$$

$$b) \frac{x^2+1}{|x|} \rightarrow |x| + \frac{1}{|x|} \xrightarrow{|x| \geq 0} R_y = [2, +\infty)$$

$$y = \frac{x^2+2x-2}{x+3} \rightarrow yx + 3y = x^2 + 2x - 2 \rightarrow$$

②

$$x^2 + x(2-y) - 2 - 3y = 0 \rightarrow x = \frac{y-2 \pm \sqrt{y^2-4y+4+12y}}{2}$$

$$y^2+4y+12 \geq 0 \rightarrow (y+2)(y+6) \geq 0 \rightarrow \frac{-6}{+} \frac{-2}{-} \rightarrow R_y =]R - (-6, -2]$$

$$f(x) = \frac{x^2-x+\frac{1}{x}}{x^2-x+1} \rightarrow (x-\frac{1}{x})^2 \rightarrow \Delta=0, a>0 \rightarrow \text{هنا نقطة واحدة}$$

③

$$x^2-x+1 \rightarrow \Delta < 0, a > 0 \rightarrow \text{هنا نقطة واحدة}$$

$$D_f = \mathbb{R} \quad , \quad yx^2 - yx + y = x^2 - x + \frac{1}{x} \rightarrow x^2(y-1) + x(-y+1) + y - \frac{1}{x} = 0$$

$$\Delta > 0 \rightarrow (y-1)^2 - 4(y-1)(y-\frac{1}{x}) = 0 \rightarrow (y-1)(y-\frac{1-4y+1}{-4y}) \quad \frac{0}{-} \frac{1}{+} \frac{-}{-}$$

$$R_f = [0, 1]$$

④

$$y = \sqrt{-x^2+5x-1} \rightarrow \text{ent} \begin{cases} 2 \\ -5+1-1=3 \end{cases} \rightarrow R_y = \sqrt{(-\infty, 3]} \rightarrow$$

$$R_y = [0, \sqrt{3}]$$

$$y = \sqrt[3]{x^2-14x} \rightarrow \text{ent} \begin{cases} 2 \\ 1-14=-13 \end{cases} \rightarrow R_y = \sqrt[3]{[-1, +\infty)} \rightarrow$$

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

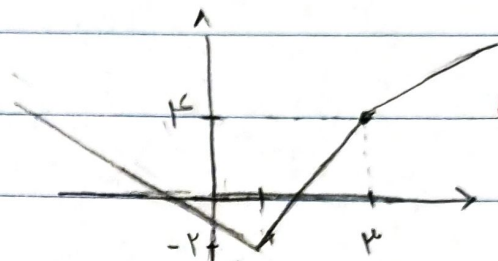
$$y = \log(n^k - n + 1) = A \rightarrow R_A = \mathbb{R} \rightarrow R_y = \log R_A \rightarrow R_y = \mathbb{R}$$

$$y = \log\left(\frac{n^k + 1}{n}\right) \rightarrow n + \frac{1}{n} \rightarrow n > 0 \rightarrow [1, +\infty) \rightarrow$$

$$R_y = \log [1, +\infty) = [1, +\infty)$$

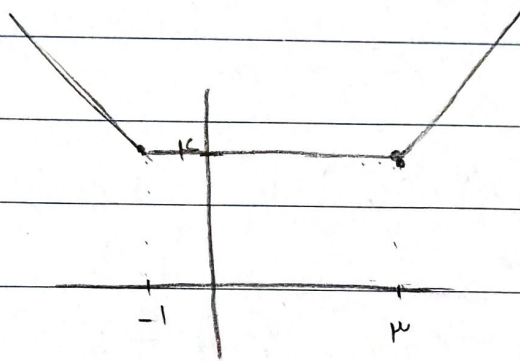
$$y = |n - k| - |n - k| \rightarrow$$

$-n - 1$	k	$n + 1$
$-k$	k	k



$$R_y = [-k, +\infty)$$

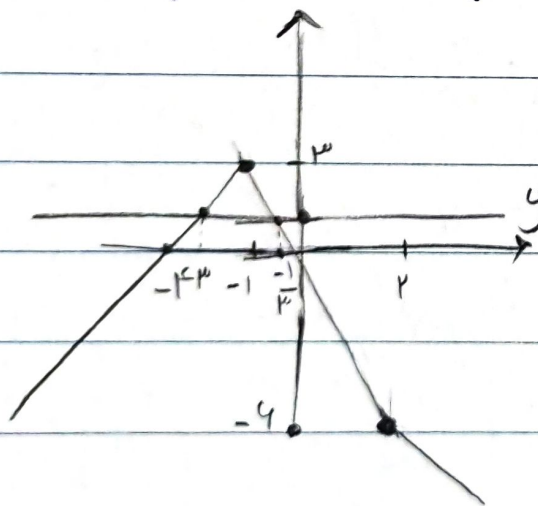
$$y = |n - k| + |n + 1|$$



$$R_y = [k, +\infty)$$

$$|n - k| - |n + k| \leq 1$$

$n + k$	$-k$	$-n - k$
k	$-k$	$-k$

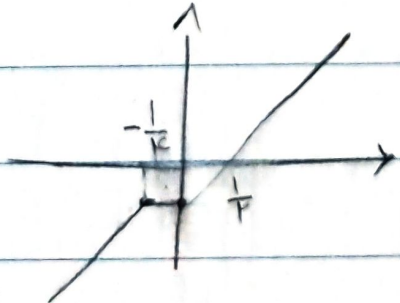


$$y = 1 \quad n = k, \quad n = -\frac{1}{k}$$

$$R_y = \mathbb{R} - [-k, -\frac{1}{k}]$$

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

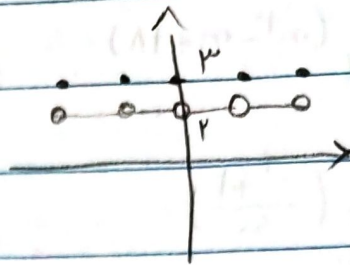
$kn + 1$	-1	$kn - 1$
$-\frac{1}{k}$	-1	0



$$R_f = \mathbb{R}$$

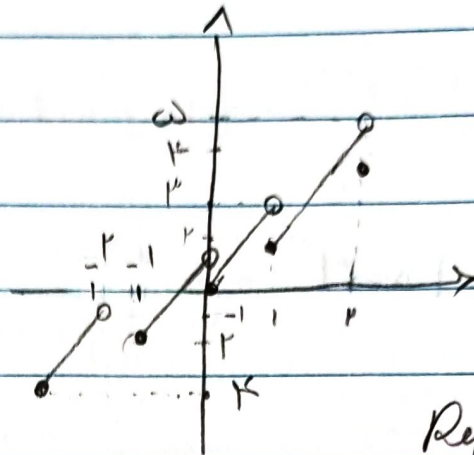
SUBJECT:

$$y = [n] + [r-n] = [n] + [-n] + r$$



①

$$y = r - [n]$$



$Re y \in [-r, \infty)$

$$n \in [-r, -1) \rightarrow y = r - [n] + 1$$

$$n \in [-1, 0) \rightarrow y = r - [n]$$

$$n \in [0, 1) \rightarrow y = r - [n]$$

$$n \in [1, r) \rightarrow y = r - [n]$$

$$n = r \rightarrow y = r$$

$$y \leq \sin^r n - \sin n + 1 \xrightarrow[\sin n = -1]{\text{① min}} 1 + 1 + 1 = r, \xrightarrow[\sin n = 1]{\text{② max}} 1 - 1 + 1 = 1$$

②

$$\xrightarrow[\sin n = \frac{1}{r}]{\text{③ } -\frac{1}{r}} \frac{1}{r} - \frac{1}{r} + 1 = \frac{r}{r} \rightarrow Re y = \left[\frac{r}{r}, r \right]$$

$$y \leq \sin^r n + \sin^r n + 1 \xrightarrow[\sin n = 0]{\text{① min}} y \leq 1 \xrightarrow[\sin n = 1]{\text{② max}} y \leq r$$

$$\xrightarrow[\sin n = -\frac{1}{r}]{\text{③ } -\frac{1}{r}} 0 + 0 + 1 \rightarrow Re y \in [1, r]$$