

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۳ کلاس
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$$y = \frac{n^2 + n + r}{n-1} \Rightarrow y(n-1) = n^2 + n + r$$

$$n^2 + (1-y)n + r(y-1) = 0 \Rightarrow n = \frac{-(1-y) \pm \sqrt{\Delta}}{2}$$

$$\Delta \geq 0 \Rightarrow (1-y)^2 - 4r(y-1) \geq 0 \Rightarrow (1-y)(1-y-4r) \geq 0$$

$$R_f = (-\infty, 1] \cup [4r, \infty)$$

$$\frac{-1}{2} \leq \frac{1}{2} \leq \frac{1}{2}$$

الف) $y = \frac{n^2 + n + r}{n-1}$ $\lambda_{\min} = 0$ $\lambda_{\max} = -\frac{1}{\lambda}$ $R_f = [-\frac{1}{\lambda}, \infty)$ $\lambda \log n^2 + n + r + \lambda$

ب) $y = \sqrt{n^2 + n + r}$ $\Rightarrow -n^2 + n + r = 0 \Rightarrow n_{\min} = r$ $\sqrt{r+1} = R_f = [0, r]$ $R_f = R$

ج) $y = \sqrt{n^2 + n + r}$ $\Rightarrow \sqrt{r+1} = R \Rightarrow R_f = [0, \infty)$

الف) $y = \frac{n+1}{n-1} \Rightarrow n(y-1) = n+1 \Rightarrow n(y-1) = n+1$ $n = \frac{(y+1)}{y-1} \Rightarrow y = \frac{(y+1)}{y-1}$ $R_f = [R - \frac{1}{r}, \infty)$

ب) $y = \frac{n+1}{n-1}$ $R = [0, \infty) - \{r\}$ $-r + y \leq \infty \Rightarrow n = \frac{-(1+r)}{y-1} \Rightarrow y \neq \frac{1}{r} \Rightarrow R = [0, \infty)$

ج) $y = \frac{n^2 + r}{n^2 + 1} \Rightarrow \sqrt{n^2 + 1} = \frac{1}{\sqrt{n^2 + r}} \Rightarrow \frac{1}{a} = \frac{1}{r} \Rightarrow R = [r, \infty)$

د) $y = \frac{n^2 + 1}{n^2 + r} + c = c \Rightarrow n^2 + c = \frac{1}{n^2 + r} - c \Rightarrow \frac{1}{c} + c = r \Rightarrow R_f = [\frac{1}{c} + c, \infty)$

$y = \frac{n^2 + r}{n^2 + 1}$ $y(n^2 + 1) = n^2 + r$

$n^2 = \frac{y-r}{y-1} \Rightarrow n = \pm \sqrt{\frac{y-r}{y-1}}$ $\frac{-r}{y-1} \geq 0$

$R = (-\infty, r] \cup (r, \infty)$

$y = \frac{n^2 + r}{n^2 + 1}$ $y(n^2 + 1) = n^2 + r$

$\frac{1}{n^2} \rightarrow \max n^2 \rightarrow \infty \Rightarrow y \rightarrow r$

$\min n^2 \rightarrow 0 \Rightarrow y \rightarrow 1$

$n^2 \geq 0 \Rightarrow n = \pm 1$

$R = (-\infty, r] \cup (r, \infty)$

$y = \frac{r \sin \theta}{\sin \theta + r}$ $y(\sin \theta + r) = r \sin \theta$

$(r-y) \sin \theta = r - ry \Rightarrow \sin \theta = \frac{r(1-y)}{r-y}$ $R_f = [\frac{r}{r-1}, \frac{1}{r}]$

$\frac{r(1-y)}{r-y} \geq 0 \Rightarrow \frac{-r}{-d+b} \geq 0$

$\frac{1}{r-y} \geq 0 \Rightarrow \frac{1}{-d+b} \geq 0$

$y = \frac{r \sin \theta}{\sin \theta + r}$ $\frac{1}{n^2} \rightarrow \max \sin \theta = 1$ $\frac{r-1}{1+r} \geq \frac{1}{r}$

$\min \sin \theta = -1$ $\frac{-r-1}{-1+r} \geq -\frac{r}{r}$

$R_f = [\frac{r}{r-1}, \frac{1}{r}]$

$$f(x) = \frac{x^2 - x + \frac{1}{2}}{x^2 - x + 1} \quad \text{for } x \in \mathbb{R} \quad D_f = \mathbb{R}$$

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

$$\Delta \geq 0 \rightarrow (y-1)^2 - 2(\frac{1}{2}-y)(1-y) \geq 0$$

$$-2y(y-1) \geq 0$$

$$\frac{0}{-1+1} = 0$$

$$(1-y)x^2 + (y-1)x + \frac{1}{2} - y \geq 0 \Rightarrow x = \frac{-(y-1) \pm \sqrt{\Delta}}{2(1-y)}$$

$$R_f = [0, 1]$$

$$f(x) = |x-1| + |x+1|$$

$$x \geq 0 \rightarrow -1$$

$$x > 1 \rightarrow -2$$

$$x < -1 \rightarrow 2$$

$$x \leq -2 \rightarrow 1$$

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$$f(x) = |x-1| + |x+1|$$

$$x \geq 1 \rightarrow y = 2$$

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$$|x-1| - |x+1| \leq 1 \Rightarrow |x-1| = |x+1| + 1$$

$$y = |x-1| - |x+1|$$

$$x \geq 1 \rightarrow 0 - 2x + 2 = -2x + 2$$

$$x = 1 \rightarrow 0 - 2 + 2 = 0$$

$$x < 1 \rightarrow 2 - 2x - 2 = -2x$$

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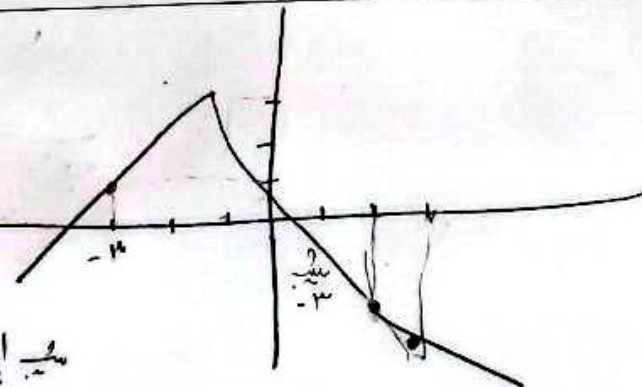
$$y = -x + 2$$

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$$f(x) = [x] + [x-1]$$

$$y = [x] + [x-1]$$

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$$R = \{x \in \mathbb{R} \mid x \in \mathbb{Z}\}$$

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$$y = [x] - [x-1]$$

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