

Subject:

Year:

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ارژین سرین تلف ۱۰

Name

① $f(n) = \frac{n-1}{2} \rightarrow f^{-1}(n) = \frac{n+1}{2} \xrightarrow{n=0} y = \frac{1}{2}$ (۲)

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

$S = \frac{1}{2} \times \left(\frac{1}{2}\right) \times \frac{1}{2} = \frac{1}{12}$ ✓

② $y = n^2 - 2n + 3 \quad n \geq 1 \quad y = (n-1)^2 + 2$ دامنه از اس $\checkmark$
 $\rightarrow$ $R = [2, +\infty) \quad D = [1, +\infty)$ به است
 $y' = \pm \sqrt{n-2} + 1$ $\xrightarrow{\text{بانه به بر د}} y^{-1} = \pm \sqrt{n-2} + 1 \quad x \geq 2$ ✓

ب) $y = n^2 - 2n + 3 \quad n \geq 3 \quad y = (n-1)^2 + 2$ دامنه از اس $\checkmark$
 $D_y = [3, +\infty) \quad R = [4, +\infty)$
 $y' = \pm \sqrt{n-2} + 1$ $\xrightarrow{\text{بانه به بر د}} y^{-1} = \sqrt{n-2} + 1 \quad x \geq 4$ ✓

③ $f(n) = 2n - \sqrt{14 - 12n + 5n^2} \Rightarrow f(n) = 2n - \sqrt{14 - 12n + 5n^2}$
 $\Rightarrow f(n) = 2n - \sqrt{5(n^2 - 4n + 2)} \Rightarrow f(n) = 2n - 2|x-2|$ (۲)

$\xrightarrow{2n+2n-4} 2n-2n+4=4$ $\rightarrow f(n) = 4n-4 \quad x \leq 2$
 $R = (-\infty, 4]$

$\rightarrow f^{-1}(n) = \frac{n+4}{2} \rightarrow x \leq 2$

$S = \frac{(2+1)4}{2} = 6$ ✓

④ $y = \frac{x}{\sqrt{x^2-5}} \xrightarrow{\text{عنه به بر د}} x = \frac{y}{\sqrt{y^2-5}} \quad x^2 = \frac{y^2}{y^2-5}$ (۱)

$x^2 y^2 - 5n^2 = y^2 \quad x^2 y^2 - y^2 = 5n^2 \quad y^2(x^2 - 1) = 5n^2 \rightarrow y^2 = \frac{5n^2}{x^2 - 1}$

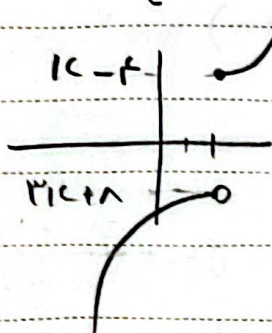
$y = \pm \sqrt{\frac{5n^2}{x^2 - 1}} \quad f(x) = \frac{x}{\sqrt{x^2-5}} \rightarrow y = \pm \sqrt{\frac{5n^2}{x^2 - 1}}$ ✓

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⑥

$$g(x) = \begin{cases} x^r - rx + r^2 & ; x \geq r \\ -x^r + rx + r^2 & ; x < r \end{cases}$$

(r)



$$r^2 + r \leq r^2 - r$$

$$r \leq -1$$

$$|r| \leq 1$$

⑦

$$f(x) = rx + |x|$$

$$f(x) = \begin{cases} rx & x > 0 \\ rx & x \leq 0 \end{cases}$$

$$f^{-1}(x) = \begin{cases} \frac{x}{r} & x > 0 \\ \frac{x}{r} & x \leq 0 \end{cases}$$

(r)

$$\rightarrow f^{-1}(x) = \frac{rx}{r} - \left| \frac{x}{r} \right| \rightarrow f^{-1}(x) = \frac{r}{r} x - \frac{1}{r} |x|$$

$$a = \frac{r}{r} \quad b = -\frac{1}{r} \quad ab = -\frac{r}{r^2}$$

⑧

$$f(x) = \frac{rx + r}{x + m} \xrightarrow{(r-1)} \frac{1}{r+m} = -1 \rightarrow m = -r$$

(r)

$$f(x) = \frac{rx + r}{x - r} \xrightarrow{a+d=0} f(x) = f^{-1}(x)$$

$$f \circ f^{-1}(x) + f^{-1}(x) = x$$

$$rx + f(x) = x \rightarrow f(x) = 0 \rightarrow x = -\frac{r}{r} \checkmark$$

$$\textcircled{8} f(3-2n) = 2 - g\left(\frac{n}{2}\right)$$

$$2 - g\left(\frac{n}{2}\right) = -2 \rightarrow g\left(\frac{n}{2}\right) = 4 \xrightarrow{g^{-1}\left(\frac{n}{2}\right)} \frac{n}{2} = g^{-1}(4)$$

$$g\left(\frac{n}{2}\right) = 2 - f(3-2n) = 4 \rightarrow f(3-2n) = -2 \xrightarrow{f^{-1}(-2)} 3-2n = f^{-1}(-2)$$

$$4\left(\frac{n}{2}\right) + 3 - 2n = 3 \checkmark$$

$$\textcircled{9} -x = \frac{-5y - 13}{1+y} \rightarrow x = \frac{5y + 13}{1+y} = x \quad y = \frac{x - 13}{x - 5}$$

قرینه برعکس: فقط x و y قدرینه می شوند! این کاری نه کردی مال نیمه دوم و چهارم

$$y = \frac{13 - x}{x - 5} \rightarrow y = \frac{13 - (x + 2)}{(x - 2) - 5} - 3 \Rightarrow y = \frac{-x + 15}{x - 7} - 3 = \frac{5x - 13}{1 - x}$$

$$\frac{-x + 15 - 3x + 21}{x - 7} = \frac{5x - 13}{1 - x} \rightarrow \frac{-4x + 36}{x - 7} = \frac{5x - 13}{1 - x}$$

$$\rightarrow -4x + 36 + 4x^2 - 28x = 5x^2 - 35x - 13x + 91$$

$$\rightarrow y = x^2 - 11x + 55 \xrightarrow{S} \textcircled{\Delta} \rightarrow \text{مستقیم}$$

$$\textcircled{10} f(n) = n + f[n] \rightarrow n = y + f[y] \rightarrow [n] = [y + f[y]]$$

$$\rightarrow [n] = f[y] + [y] \rightarrow [n] = 5[y] \xrightarrow{\text{مساوی}} n = y + f[n]$$

$$\rightarrow g(y) = n - \frac{f}{5}[n] \quad n + f[n] - n + \frac{f}{5}[n] = \frac{4f}{5}[n] \checkmark$$