

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۵۵ ... کلاس ... اینهمه ...

$$\text{الف)} \quad \frac{n-1}{n} - \frac{n}{n-1} \geq 0 \rightarrow \frac{(n-1)^2 - n^2}{n(n-1)} \geq 0 \rightarrow \frac{(n-1-n)(n-1+n)}{n(n-1)} \geq 0 \rightarrow \frac{1-2n}{n(n-1)} \geq 0$$

$$\Rightarrow \frac{1}{+} \frac{-}{-} \frac{1}{+} \rightarrow D = (-\infty, 0) \cup \left[\frac{1}{2}, 1\right)$$

ب)

- $n+1 \neq 0 \rightarrow n \neq -1$
- $n \neq 0$
- $n-1 \neq 0 \rightarrow n \neq 1$
- $n+2 \neq 0 \rightarrow n \neq -2$

$$\frac{3n^2 + 4n - 1}{(n-1)(n+2)} \neq 0 \rightarrow 3n^2 + 4n - 1 \neq 0 \rightarrow n \neq \frac{-4 \pm \sqrt{16 + 12}}{6} \Rightarrow D = \mathbb{R} - \left\{-2, 0, \pm 1, -\frac{1}{3}\right\}$$

$$\text{ج)} \quad (x^{-n} - x^2)(x^5 - x^m) \geq 0 \rightarrow \frac{-x}{+} \frac{x^5}{-} \rightarrow D = (-\infty, -2] \cup [2, \infty + \infty)$$

د)

- $n-1 \geq 0 \rightarrow n \geq 1$
- $y+1$

$$\text{①)} \quad x^2 - n - 2 \geq 0 \rightarrow (n+1)(n-2) \geq 0 \rightarrow \frac{-1}{+} \frac{2}{-} \rightarrow (-\infty, -1) \cup (2, +\infty)$$

$$\text{②)} \quad x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow \begin{matrix} x \geq 1 \\ x \leq -1 \end{matrix} \rightarrow (-\infty, -1] \cup [1, +\infty)$$

$$\text{③)} \quad \sqrt{x^2 - 1} + 1 \neq 0 \rightarrow \sqrt{x^2 - 1} \neq -1 \rightarrow \text{دایره برقرار}$$

$$\text{①} \cap \text{②} \cap \text{③} = (-\infty, -1) \cup (2, +\infty)$$

$$\text{ه)} \quad -x^2 + ax + 3 \geq 0 \xrightarrow{a=-2} -x^2 - 2x + 3 = 0 \rightarrow -1 - 2a = 0 \rightarrow 2a = -1 \rightarrow a = -\frac{1}{2}$$

$$-x^2 - \frac{1}{2}x + 3 \geq 0 \rightarrow x = \frac{-\frac{1}{2} \pm \sqrt{\frac{1}{4} + 12}}{-2} \rightarrow x = -2, \frac{3}{2} \rightarrow \frac{-x}{-} \frac{3}{+} \frac{2}{-}$$

$$D = \left[-2, \frac{3}{2}\right] \rightarrow b = \frac{3}{2}$$

$$a+b = -\frac{1}{2} + \frac{3}{2} = \text{①}$$

ز)

$$f(n) - n \geq 0 \xrightarrow{\text{نشان ده}} \begin{cases} 3n - 2 = n \rightarrow 2n = 2 \rightarrow n = 1 \\ 3n + 3 = n \rightarrow n = -3 \end{cases}$$

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

$$f\left(\frac{\sqrt{x}}{y} + \frac{x}{y}\right) = f\left(\frac{x + \sqrt{x}}{y}\right) = x \times \frac{x + \sqrt{x}}{x} \left(\frac{\sqrt{x}}{x} + 1 - x\right) = \left(\frac{\sqrt{x} + x}{x}\right) \frac{\sqrt{x} - x}{x}$$

$$f(n) = 2n(n-2)$$

$$\rightarrow = \frac{x-x}{x} = \left(-\frac{1}{x}\right)$$

6

$$\star \text{ برعکس ایا می شود } f(f(a)) = a$$

داده شد

$$f\left(\frac{a+1}{a-1}\right) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-x}{a-1}}{\frac{x+1-x+1}{a-1}} = \frac{\frac{2a}{a-1}}{\frac{2}{a-1}} = \frac{2a}{2} = a \rightarrow \text{پس در برعکس ایا می شود؟} \\ a=1 \text{ نخرج راضی نیست}$$

$$C, R - \{1\}$$

7

$$\star f(\sqrt{a^2-1}) = (\sqrt{a^2-1})^2 - x(\sqrt{a^2-1}) = a^2-1 - x\sqrt{a^2-1} = -x$$

$$a^2-1 - x\sqrt{a^2-1} + x = 0 \rightarrow (\sqrt{a^2-1} - x)^2 = 0 \rightarrow \sqrt{a^2-1} = x \rightarrow a^2-1 = x^2 \\ a^2 = x^2 + 1 \\ a = \pm \sqrt{x^2 + 1}$$

8

$$f(n+x) = (n-x)(n-x)$$

$$f(x) \rightarrow n+x = x \rightarrow n=1 \rightarrow f(x) = \left(1-\frac{1}{x}\right)\left(1-\frac{1}{x}\right) = \frac{x-1}{x}$$

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

$$f(-x) \times f(x) = \left(x^2 + \frac{1}{x^2}\right) \times \frac{x-1}{x} = 1 \times \frac{x-1}{x}$$

9

$$x \cos^2 m + 2 \cos m = x, \Delta \rightarrow x \pm^2 + 2 \cos m - x, \Delta = 0 \rightarrow 1 \pm^2 + 1 \cdot \pm - 1 = 0$$

$$\Delta = 3 \times 1 = 3 \Rightarrow t = \frac{-1 \pm \sqrt{3}}{1} \rightarrow t = \frac{1}{2}, \frac{-3}{2} \Rightarrow \cos m = \frac{1}{2}$$

$$1 + \tan^2 m = \frac{1}{\cos^2 m} \rightarrow \frac{1}{\cos^2 m} = x \rightarrow 1 + \tan^2 m = x \rightarrow \tan^2 m = (x-1) = f(x, \Delta)$$

10