

۱۷/۲۵

نام و نام خانوادگی: ... پاسخنامه تشریحی تکلیف شماره ... کلاس: ... یازدهم ... B ...

الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0$
 $\frac{(x-1)^2 - x^2}{x(x-1)} = \frac{(x-1+x)(x-1-x)}{x(x-1)} \geq 0$
 $\frac{(2x-1)(-1)}{x(x-1)} = \frac{-2x+1}{x(x-1)} \quad \left| + \frac{1}{x} - \frac{1}{x-1} \right|$
 $Df = (-\infty, 0) \cup \left[\frac{1}{2}, 1\right) \checkmark$

ب) $\frac{1}{x+1} - \frac{x}{x} = \frac{-x-2}{x(x+1)}$
 $\frac{x}{x-1} + \frac{1}{x+2} = \frac{-x-2}{x(x+1)}$
 $\frac{x}{x-1} \neq 0 \Rightarrow x \neq -\frac{2}{x}$
 $x(x+1) \neq 0 \Rightarrow x \neq -1, 0 \Rightarrow (x-1)(x+2) \neq 0 \Rightarrow x \neq 1, -2$
 $Df = \mathbb{R} - \{-2, -1, 0, 1\} \checkmark$

الف) $\left[\left(\frac{1}{x}\right)^x - 9\right] \left(4x - \varepsilon^x\right) \geq 0$
 $\left\{ \begin{array}{l} + \\ - \end{array} \right\} \quad \left\{ \begin{array}{l} + \\ - \end{array} \right\}$
 صفرشوند: $x = 2, 0, -2$
 هر دو + شوند: $(-\infty, -2) \cap (-\infty, 2, 0) = (-\infty, -2)$
 هر دو - شوند: $(-2, +\infty) \cap (2, 0, +\infty) = (2, +\infty)$
 $Df = (-\infty, -2] \cup [2, 0, +\infty) \checkmark$

ب) $\sqrt{y+1} = -\sqrt{x-1} + 2 \geq 0$
 $-\sqrt{x-1} \geq -2 \Rightarrow \sqrt{x-1} \leq 2$
 $x-1 \leq 4 \Rightarrow x \leq 5$
 $\sqrt{x-1} \geq 0 \Rightarrow x-1 \geq 0 \Rightarrow x \geq 1$
 $Df = [1, 5] \checkmark$

$x^2 - x - 2 > 0 \quad (x-2)(x+1) > 0 \quad \left| + \frac{-1}{x+1} - \frac{2}{x} \right| \quad (-\infty, -1) \cup (2, +\infty)$
 $\sqrt{x^2-1} \Rightarrow x^2-1 \geq 0 \quad (x+1)(x-1) \geq 0 \quad \left| + \frac{-1}{x-1} - \frac{1}{x+1} \right| \quad (-\infty, -1) \cup (1, +\infty)$
 $Df = \left[(-\infty, -1) \cup (2, +\infty)\right] \cap \left[(-\infty, -1) \cup (1, +\infty)\right] = (-\infty, -1) \cup (2, +\infty) \checkmark$

$f(x) = \sqrt{-x^2 + ax + 2}$
 $f(-2) = -(-2)^2 - 2a + 2 = 0$
 $-2a - 2 + 2 = 0 \Rightarrow -2a = 0 \Rightarrow a = 0$
 $f(x) = \sqrt{-x^2 - \frac{1}{x} + 2} \Rightarrow \Delta = \frac{1}{x} - \varepsilon(-1)(2) = \frac{59}{x}$
 $\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{\frac{1}{x} \pm \frac{\sqrt{59}}{x}}{-2} = \left\{ \begin{array}{l} \frac{1}{x} - \frac{\sqrt{59}}{x} = -2 \\ \frac{1}{x} + \frac{\sqrt{59}}{x} = -2 \end{array} \right\} \Rightarrow b$
 $a+b = \frac{2}{x} - \frac{2}{x} = 0$

$f(x) - x \geq 0 \Rightarrow f(x) - x = \begin{cases} 2x-2 \rightarrow 2x-2 \geq 0 \Rightarrow 2x \geq 2 \Rightarrow x \geq 1 \\ x+2 \rightarrow x+2 \geq 0 \Rightarrow x \geq -2 \end{cases}$
 $Df = [1, +\infty) \cup [-2, +\infty) = [1, +\infty) \cup [-2, +\infty)$

$$2f(0) = 2(a+1)(a+c) = 12a+12$$

$$f(-1) = 2a - 2$$

$$\Rightarrow 12a+12 = 2a-2+a$$

$$10a = -14 \quad \boxed{a = -1.4} \checkmark$$

$$f(n) = \frac{n+1+\sqrt{n}}{\sqrt{n}} \Rightarrow f(\sqrt{n}) = \frac{\sqrt{n}+1+\sqrt{\sqrt{n}}}{\sqrt{\sqrt{n}}} \quad f(1+\sqrt{n}) = \frac{1+\sqrt{n}+1+\sqrt{1+\sqrt{n}}}{\sqrt{1+\sqrt{n}}}$$

$$f(\sqrt{n}) + f(1+\sqrt{n}) = \frac{1+\sqrt{n}+\sqrt{\sqrt{n}}+1+\sqrt{1+\sqrt{n}}}{\sqrt{\sqrt{n}}+\sqrt{1+\sqrt{n}}} =$$

$$\boxed{2 + \sqrt{\sqrt{n}+1} + \sqrt{1+\sqrt{n}}}$$

پایسته...

در صورتی اختلاف دو تابع عبارتی درجه هم می شود که هر دو تابع درجه دوم باشند.

$$f(n) = an^2 + bn + c$$

$$2(an^2 + bn + c) - 3(an^2 - bn + c) = 2an^2 + 2bn + 2c - 3an^2 + 3bn - 3c = -an^2 + 5bn - c = \varepsilon n^2 - \frac{1}{\omega} n$$

$$\Rightarrow 2a - 3a = \varepsilon \Rightarrow -a = \varepsilon \quad \boxed{a = -\varepsilon}$$

$$\Rightarrow 2b + 3b = -1 \Rightarrow 5b = -1 \quad \boxed{b = -\frac{1}{5}}$$

$$\Rightarrow 2c - 3c = 0 \Rightarrow \boxed{c = 0}$$

$$\boxed{f(n) = -\varepsilon n^2 - \frac{1}{5} n} \checkmark$$

$$x=0 \rightarrow 2f(0) = 2m-1$$

$$x=-1 \rightarrow 4f(0) = 14 + 8m-1$$

$$\left\{ \begin{array}{l} 4f(0) - 2f(0) = 14 + 8m - 2m - 1 \\ \varepsilon f(0) = 14 + 8m \\ 2f(0) = 1 + m \end{array} \right.$$

$$f(0) = 2f(0) = (2 \times \varepsilon, 0) - 1 = 11, 0$$

$$n=0 \rightarrow 2f(0) = 2m-1$$

$$2f(0) = 11, 0 \quad \boxed{f(0) = 4, 0} \checkmark$$

$$\Rightarrow 1+m = 2m-1 \Rightarrow 2m = 2 \quad m=1$$

$$f(n) = an + b \Rightarrow an + b + \frac{a}{n} + b = \frac{an^2 + 2bn + a}{n} = \frac{2n^2 - 12n + 4}{n}$$

$$\Rightarrow \boxed{a=2} \quad 2b = -12 \quad \boxed{b=-6}$$

$$f(n) = 2n - 6$$

$$f(-1) = 2(-1) - 6 = -8 \checkmark$$