

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره کلاس: تاریخ:

$f(x) = (x+1)^2 + (x^2-1)^2 + mx^2 + nx + mn$ $f(x) = x^2 + 1 + 2x + 9x^2 + 1 - 9x + mx^2 + nx + mn$
 قاعده مقادیر در آنجا که وجود دارد را مخرج کنیم.

$\rightarrow 10x^2 - 4x + 2 + mx^2 + nx + mn \rightarrow m = -10, n = 4 \rightarrow f(x) = 2 + -4x = 2 - 4x$

$g(x) = \{ (f, m), (n, p+1), (p+2, -1), (c-9, p+k) \}$
 $(f, -10), (4, p+1), (-9, -1)$
 $L: p+1 = -10 \rightarrow p = -11$
 $p+k = -1 \rightarrow -11+k = -1 \rightarrow k = 10$
 $m+n+k+p = -10 + 4 + -11 + 10 = -7$

الف) $y = \sqrt{\frac{x-2}{x^2-2x-1}}$ $\frac{x-2}{x^2-2x-1} \geq 0$ $\frac{x-2}{(x-4)(x+1)} \geq 0$
 تعیین علامت: $\frac{-}{+} = -$, $\frac{+}{-} = -$, $\frac{+}{+} = +$
 $D_f = (-2, +\infty) \cup (-1, 4)$

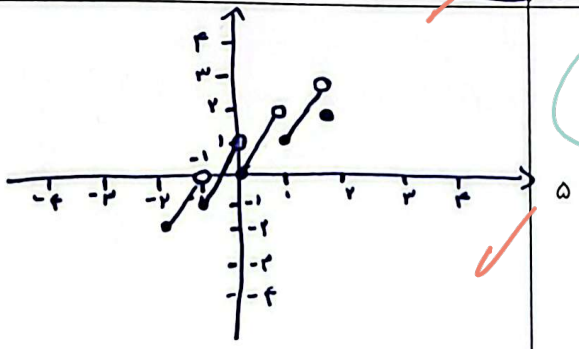
ب) $f(x) = \frac{2x^2+1}{4-x}$
 $4-x \neq 0 \rightarrow x \neq 4$
 $\rightarrow 2 \leq -x \leq 3 \xrightarrow{x-1} -2 \geq x \geq -3 \rightarrow x \in [-3, -2]$
 $D_f = \mathbb{R} - \{4\}$

الف) $f(x) = \frac{\sqrt{x(x^2-1)}}{\sqrt{x+1}}$ $x(x^2-1) \geq 0$ $|x|+x > 0$
 تعیین علامت: $x > 0$ $\frac{-}{+} = -$, $\frac{+}{-} = -$, $\frac{+}{+} = +$
 $D_f = [1, +\infty)$

ب) $f(x) = \frac{\sqrt{|x-2|-x^2}}{|x|-1}$ $|x-2|-x^2 \geq 0 \rightarrow |x-2| \geq x^2$
 $|x|-1 \neq 0 \rightarrow x \neq \pm 1$
 $D_f = [-2, 1) \cup (1, 2]$

$y = \frac{1}{||x-2|-1|-k}$ $||x-2|-1|-k \neq 0 \rightarrow ||x-2|-1| \neq k$
 $|x-2|-1 = k \rightarrow |x-2| = k+1 \rightarrow x-2 = k+1 \rightarrow x = k+3$
 $|x-2|-1 = -k \rightarrow |x-2| = 1-k \rightarrow x-2 = 1-k \rightarrow x = -k+3$
 $1-k = k+1 \rightarrow 2k = 0 \rightarrow k = 0$
 $3-k = k+1 \rightarrow 2k = 2 \rightarrow k = 1$
 اگر k صفر باشد فقط دو جواب داریم پس غلط است.

$x \in [-2, -1) \rightarrow [x] = -2, y = 2x+2$
 $x \in [-1, 0) \rightarrow [x] = -1, y = 2x+1$
 $x \in [0, 1) \rightarrow [x] = 0, y = 2x$
 $x \in [1, 2) \rightarrow [x] = 1, y = 2x-1$
 $x = 2 \rightarrow [x] = 2, y = 2x-2, x=2 \rightarrow y=2$



$$f(x) = \frac{x^2 - 4x + 3}{x+1} + b \quad \text{برای } x^2 - 4x + 3 = 0 \rightarrow (x-1)(x-3) = 0 \rightarrow x=1, 3$$

صورت: $x^2 - 4x + 3$
 مخرج: $x+1$

$$\textcircled{1} x=1 \rightarrow f(1) = \frac{1-4+3}{1+1} + b = 1 \rightarrow b=1, \quad x=0 \rightarrow f(0) = \frac{3}{1} + b = 0 \rightarrow \frac{3}{1} + b = 0 \rightarrow b = -3$$

$$\textcircled{2} x=3 \rightarrow f(3) = \frac{9-12+3}{3+1} + b = 3 \rightarrow b=3, \quad x=2 \rightarrow f(2) = \frac{4-8+3}{2+1} + b = 0 \rightarrow \frac{4-8+3}{2+1} + b = 0 \rightarrow b = -1$$

$$\textcircled{1} \rightarrow a-b = -3-1 = -4 \quad \textcircled{2} \rightarrow a-b = -1-3 = -4$$

$$f(x) = \begin{cases} \frac{x^2 + 2x^2 - x - 2}{x^2 - 1} & x \neq \pm 1 \\ \frac{ax+1}{x+b} & x = \pm 1 \end{cases} \quad \text{برای } x \neq \pm 1 \quad \frac{(x^2 + 2x^2 - x - 2)}{(x-1)(x+1)} = \frac{(x+1)(x+2)}{(x-1)(x+1)} = \frac{x+2}{x-1}$$

$$g(x) = x + c = x + 2 \quad \text{برای } x = \pm 1 \quad \frac{ax+1}{x+b} = x+2 \rightarrow \begin{cases} a+b = 3 \\ a-b = 1 \end{cases} \rightarrow \begin{cases} a=2 \\ b=1 \end{cases}$$

$$\text{برای } x=1 \rightarrow f(1) = \frac{a+1}{1+b} = g(1) = 1+2 = 3 \rightarrow \frac{a+1}{1+b} = 3 \rightarrow a+1 = 3+3b \rightarrow 3b = a-2$$

$$\text{برای } x=-1 \rightarrow f(-1) = \frac{-a+1}{-1+b} = g(-1) = -1+2 = 1 \rightarrow \frac{-a+1}{-1+b} = 1 \rightarrow -a+1 = -1+b \rightarrow b = -a+2$$

$$f(x) = \sqrt{f-x-2a} + f-1, \quad g(x) = \sqrt{b-fx} + 1, \quad f-g \in [0, k]$$

$$D_f = f-x-2a \geq 0 \rightarrow f-x \geq 2a \rightarrow x \leq \frac{f-2a}{1}$$

$$D_g = b-fx \geq 0 \rightarrow fx \leq b \rightarrow x \leq \frac{b}{f}$$

$$\sqrt{f-x-2a} + f-1 - (\sqrt{b-fx} + 1) = k$$

$$\sqrt{f-x-2a} - \sqrt{b-fx} = k - f + 2$$

$$\sqrt{f-x-2a} = \sqrt{b-fx} + k - f + 2$$

$$\sqrt{f-x-2a} = \sqrt{b-fx} + k - f + 2$$

$$\sqrt{f-x-2a} = \sqrt{b-fx} + k - f + 2$$

$$f(x) = \sqrt{m-x} + n, \quad g(x) = \sqrt{x+1} \rightarrow x+1 \geq 0 \rightarrow x \geq -1 \quad D_{f \cap g} = [-1, 7]$$

$$m-x \geq 0 \rightarrow x \leq m \rightarrow m=7$$

$$f-g(x) = 4\sqrt{2}$$

$$f(x) = \sqrt{7-x} + n = 2+n$$

$$g(x) = \sqrt{x+1} = 2\sqrt{2}$$

$$\sqrt{7-x} + n = 2+n \rightarrow \sqrt{7-x} = 2 \rightarrow 7-x = 4 \rightarrow x = 3$$

$$m+n = 7 + 8\sqrt{2} - 2 = 8\sqrt{2} + 5$$

$$y = (-1)^x (x - [x]) = \frac{1}{2}$$

$$y = x - [x]$$

$$x \in [-2, -1), [x] = -2 \rightarrow y = x + 2 \begin{cases} x = -2 \rightarrow y = 0 \\ x = -1 \rightarrow y = 1 \end{cases}$$

$$x \in [-1, 0), [x] = -1 \rightarrow y = x + 1 \begin{cases} x = -1 \rightarrow y = 0 \\ x = 0 \rightarrow y = 1 \end{cases}$$

$$x \in [0, 1), [x] = 0 \rightarrow y = x \begin{cases} x = 0 \rightarrow y = 0 \\ x = 1 \rightarrow y = 1 \end{cases}$$

$$x \in [1, 2), [x] = 1 \rightarrow y = x - 1 \begin{cases} x = 1 \rightarrow y = 0 \\ x = 2 \rightarrow y = 1 \end{cases}$$

$$x = 2 \rightarrow [x] = 2 \rightarrow y = x - 2 \rightarrow x = 2 \rightarrow y = 0$$

