

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۵۰ کلاس فصل دوم

الف) $\frac{x-1}{x} - \frac{x}{x-1} \rightarrow \frac{(x-1)(x-1) - x \times x}{x(x-1)}$ $\frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{x^2 - 2x + 1 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{1-2x}{x(x-1)} \geq 0$ در صورتی که $\frac{1}{x} > 0$ و $\frac{1}{x-1} > 0$ $\frac{1}{+} - \frac{1}{+} = -$ $D_f = (-\infty, 0) \cup (\frac{1}{2}, 1)$	صورت $\frac{1}{x+1} - \frac{1}{x} = \frac{x - (x+1)}{x(x+1)} = \frac{-1}{x(x+1)}$ مخرج $\frac{1}{x-1} + \frac{1}{x+2} = \frac{x(x+2) + (x-1)}{(x-1)(x+2)}$ $\frac{x(x+2)}{(x-1)(x+2)}$ مخرج باید منفی شود مخرج $x(x+2) = 0 \rightarrow x = -2, 0$ $D_f = (-\infty, -2) \cup (0, 1) \cup (1, 2) \cup (2, +\infty)$	۱
الف) $(\frac{x}{x+1})^2 - 9 = 0 \rightarrow x = -1$ $x^2 - 9 = 0 \rightarrow x = 3, -3$ $\frac{x}{x+1} = 3 \rightarrow x = 3(x+1) \rightarrow x = 3x + 3 \rightarrow -2x = 3 \rightarrow x = -\frac{3}{2}$ $\frac{x}{x+1} = -3 \rightarrow x = -3(x+1) \rightarrow x = -3x - 3 \rightarrow 4x = -3 \rightarrow x = -\frac{3}{4}$ $D_f = (-\infty, -\frac{3}{4}] \cup [\frac{3}{2}, +\infty)$	$\sqrt{x-1} + \sqrt{x+1} = 3$ $x-1 \geq 0 \rightarrow x \geq 1$ $(\sqrt{x-1})^2 + (\sqrt{x+1})^2 - 2\sqrt{x-1}\sqrt{x+1} = 9$ $x-1+x+1-2\sqrt{x^2-1} = 9$ $2x-2-2\sqrt{x^2-1} = 9$ $x-1-\sqrt{x^2-1} = \frac{9}{2}$ $x-1 \leq 12$ $1 \leq x \leq 13$ $D_f = [1, 13]$	۲
$x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0$ $x^2 - 1 > 0 \rightarrow \frac{-1}{+} - \frac{1}{+} = +$ $D_f = (-\infty, -1) \cup (2, +\infty)$	مخرج همواره مثبت است	۳
$\frac{1}{x} - \frac{1}{x-2} - 2a = 0 \rightarrow 2a = 1 \rightarrow a = \frac{1}{2}$ $\frac{1}{x} - \frac{1}{x-2} = 1 \rightarrow \frac{x-2-x}{x(x-2)} = 1 \rightarrow \frac{-2}{x(x-2)} = 1$ $-2 = x(x-2) \rightarrow x^2 - 2x + 2 = 0$ $(x-1)^2 + 1 = 0$ قالب $(x-1)^2 + 1 = 0$ $x = 1 \pm i$	دو عبارت $\frac{1}{x} - \frac{1}{x-2}$ $\frac{1}{x} - \frac{1}{x-2} = 1 \rightarrow \frac{x-2-x}{x(x-2)} = 1 \rightarrow \frac{-2}{x(x-2)} = 1$ $-2 = x(x-2) \rightarrow x^2 - 2x + 2 = 0$ $(x-1)^2 + 1 = 0$ قالب $(x-1)^2 + 1 = 0$ $x = 1 \pm i$	۴
مستطیل $1, 2$ $3x - 2 - x \geq 0 \rightarrow 2x - 2 \geq 0 \rightarrow x \geq 1 \rightarrow [1, +\infty) I$ مستطیل $1, 2$ $2x + 3 - x \geq 0 \rightarrow x + 3 \geq 0 \rightarrow x \geq -3 \rightarrow [-3, +\infty) II$ $D_f = [-3, +\infty)$	دو مستطیل $1, 2$ و $1, 2$ $3x - 2 - x \geq 0 \rightarrow 2x - 2 \geq 0 \rightarrow x \geq 1 \rightarrow [1, +\infty) I$ $2x + 3 - x \geq 0 \rightarrow x + 3 \geq 0 \rightarrow x \geq -3 \rightarrow [-3, +\infty) II$ $I \cup II = [-3, +\infty)$	۵

6	$\sin \frac{\pi}{p} = \frac{\sqrt{p}}{p}, \quad \cos \frac{\pi}{p} = 1 \quad \frac{\sqrt{p}}{p} + 1 \rightarrow \text{دور}$ $f(a) = p a (a-1) \rightarrow p \left(1 + \frac{\sqrt{p}}{p}\right) \left(1 + \frac{\sqrt{p}}{p} - 1\right) \rightarrow p \left(\frac{\sqrt{p}}{p} + 1\right) \left(\frac{\sqrt{p}}{p} - 1\right) =$ $p \left(\frac{p}{p} - \frac{1}{p}\right) = p \times \frac{1}{p} = \left(\frac{1}{p}\right)$
7	$f(a) = \frac{a+1}{a-1} \rightarrow f(f(a)) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{\frac{2a}{a-1}}{\frac{2}{a-1}}$ فقط $a \neq 1 \quad a \in \mathbb{R} - \{1\}$
8	$x^2 - f(x) = -f \rightarrow x^2 - f(x) + f = 0 \rightarrow (x-f)^2 = 0 \Rightarrow \boxed{x=f}$ $g(a) = p \rightarrow \sqrt{a^2 - 1} = p \rightarrow a^2 - 1 = p^2 \rightarrow a^2 = p^2 + 1 \Rightarrow \boxed{a = \pm \sqrt{p^2 + 1}}$
9	$x + y = f \rightarrow \boxed{x=1} \rightarrow f(f) = 1 - a + y = p$ $x + y = -p \rightarrow x = -y \rightarrow f(-y) = p + y + y = p + y = p^2$ $f(f) \times f(-p) = p \times p = \boxed{p^2}$
10	$f \cos^2 x + a \cos x - \frac{p}{p} = 0 \rightarrow 1 \cos^2 x + 10 \cos x - p = 0$ $\cos^2 x + 10 \cos x - a = 0 \quad \begin{matrix} \text{دعاه} \\ \text{في } x \end{matrix} \rightarrow \cos x = t \rightarrow t^2 + 10t - a = 0$ في معادلة كبريتيه $\tan^2 x = \frac{1 - \cos^2 x}{\cos^2 x} = \frac{1 - \frac{1}{p}}{\frac{1}{p}} = \frac{p-1}{1} = p-1 \rightarrow f\left(\frac{p-1}{p}\right) = p$