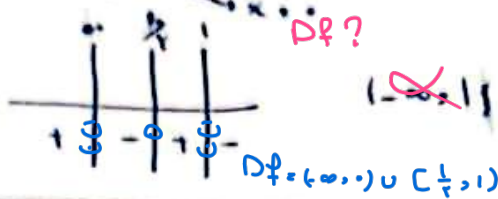


$f\left(\frac{\sqrt{x}}{x} + 1\right) \rightarrow r(x^r) - f(x)$ $r\left(\frac{r}{x} + \sqrt{x} + 1\right) - r\sqrt{x} - f \rightarrow \frac{1}{x} \quad \text{D}$	9
$f(f(a)) = a$ $\hookrightarrow \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{ra}{a-1}}{\frac{r}{a-1}} = a \quad R \setminus \{1\} \quad \text{D}$	v
$f(g(a)) = -f \quad \sqrt{a^2-1} = t$ $(\sqrt{a^2-1})^r - f\sqrt{a^2-1} = -f \rightarrow t^r - ft = -f$ $(t-r)^r = 0$ $t = r \rightarrow \sqrt{a^2-1} = r \rightarrow a = \pm \sqrt{a} \quad \text{D}$	1
$f(f) \times f(-r)$ $\left. \begin{array}{l} f(-r) \xrightarrow{x=-r} r^r + r \cdot + r = \sqrt{r} \\ f(r) \xrightarrow{x=1} 1 - a + r = r \end{array} \right\} \quad \text{D}$	9
$f(r \cos^r x + a \cos x) = \tan^r$ $\cos x = t \quad rt^r + at = \sqrt{a} \rightarrow 1+t^r+1 \cdot t - \sqrt{t} = 0$ $+r+1 \cdot t - a^r = 0$ $t = \frac{1}{\sqrt{a}} \quad t = -\frac{r}{\sqrt{a}}$ $1 + \tan^r = \frac{1}{\frac{1}{\sqrt{a}}} \rightarrow \tan^r x = \frac{r}{\sqrt{a}} = r \quad \text{D}$	1.

نام و نام خانوادگی آزاد قانون پرورد / پاسخنامه تشریحی تکلیف شماره ۵ / کلاس برزاق اینهمه A

$$\sqrt{\frac{(x-1)^2 - x^2}{(x-1)^2}} \rightarrow 1 - 2x \rightarrow x = \frac{1}{2}$$



(الف)

$$\frac{x-2x-1}{(x+1)x} \rightarrow x = -1, x = 0$$

$$\frac{2x+4, x=1}{(x-1)(x+2)} \rightarrow 2x+5 \rightarrow x = -\frac{5}{2}$$

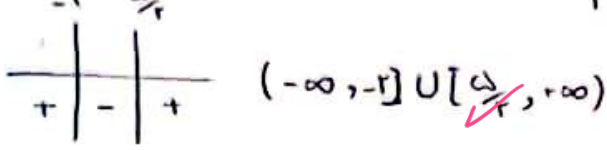
$$R = \{-\frac{5}{2}, 0, -\frac{1}{2}, 1, -2\}$$

(ب)

(1, 1/2)

$$f(x) = \sqrt{((\frac{1}{x})^x - 1)(3x - 4x^2)}$$

$x = -2$
 $3x - 4x^2 = 0$
 $3x = 4x^2 \rightarrow x = \frac{3}{4}$



(الف)

$$\sqrt{\frac{x-1}{a}} + \sqrt{\frac{y+1}{b}} = 3$$

$$\sqrt{\frac{x-1}{a}} \leq 3$$

$$a + b = 3$$

$$a \leq 3$$

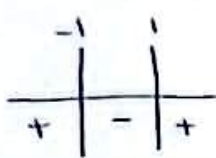
$$D_f = [1, 3]$$

(ب)

۲

$$f(x) = \frac{\log_f(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1}$$

$x = \pm 1$

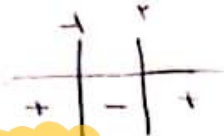


$$x^2 - x - 2 = 0$$

$$(x-2)(x+1) = 0$$

$x = 2, x = -1$

$$(-\infty, -1) \cup (2, +\infty)$$



(1, 1/2)

$$\rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$$

$$f(x) = \sqrt{x^2 + ax + 2}$$

$$-2 \Rightarrow -f - 2a + 2 = 0$$

$$a = -\frac{1}{2}$$

$$-x^2 - \frac{1}{2}x + 2 = 0$$

$$x = \frac{3}{2}$$

$$b + a = 1$$

۳

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

$\dots \geq 0$

$$\textcircled{1} \xrightarrow{x < 1} \sqrt{2x + 2 - x} \Rightarrow \sqrt{x + 2} \Rightarrow x \geq -2 \rightarrow -2 \leq x < 1$$

(1, 1/2)

دقت!

$$\textcircled{2} \xrightarrow{x \geq 1} \sqrt{3x - 2 - x} \Rightarrow \sqrt{x - 2} \Rightarrow x \geq 2 \rightarrow [-2, 1) \cup [2, +\infty)$$

$[-2, +\infty)$

$$(الف-۱) \quad \frac{x-1}{x} - \frac{x}{x-1} \geq 0 \rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{-x+1}{x(x-1)} \geq 0$$

$x^2 - x + 1 - x^2$

→ $D_f = (-\infty, 0) \cup [\frac{1}{x}, 1)$

$$۳- \log_e x^2 - x - 2 \rightarrow x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0 \quad \frac{-1 \pm 2}{+ \phi - \phi +} \rightarrow x > 2 \leq x < -1 \quad I$$

$$\sqrt{x^2-1} + 1 \rightarrow \text{جواب مثبت است} \rightarrow \sqrt{x^2-1} \rightarrow x^2-1 \geq 0 \rightarrow x \geq 1 \leq x \leq -1 \quad II$$

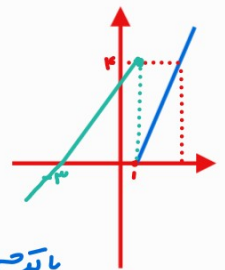
$$I, II \rightarrow x < -1, x > 2 \rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$$

$$f(x) - x = \begin{cases} x^2 - x - 2 & x \geq 1 \\ x^2 + 3 - x & x < 1 \end{cases} = \begin{cases} x^2 - x & x \geq 1 \\ x + 3 & x < 1 \end{cases}$$

$$f(x) - x \geq 0 \rightarrow \begin{cases} x^2 - x \geq 0 \rightarrow x \geq 1 \quad \checkmark \\ x + 3 \geq 0 \xrightarrow{x < 1} -3 \leq x < 1 \quad \checkmark \end{cases}$$

$$\rightarrow D_f = [-3, +\infty)$$

باید به دقت نیز مشخص است!



-۵