

شماره تلفن 8

یازدهم دضتر

کیمیاء صغائی

① الف $\sqrt{\frac{x-1}{x} - \frac{x}{x-1}}$

$$\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \rightsquigarrow \frac{-2x+1}{x(x-1)} \geq 0$$

$D_f: (-\infty, 0) \cup [\frac{1}{2}, 1)$

ب) $\frac{1}{x+1} - \frac{2}{x} = 0$

$$\frac{1}{x-1} + \frac{1}{x+2} - 2 = 0 \rightsquigarrow \frac{x^2 + 4 + x - 1}{x^2 + 2x - x - 2} = 0 \rightsquigarrow \frac{x^2 + x + 3}{x^2 + x - 2} = 0$$

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

$D_f = \mathbb{R} - \left\{ -2, -1, -\frac{3}{2}, 0, 1 \right\}$

② الف $\sqrt{\left(\left(\frac{1}{x}\right)^x - 9\right)(3x - 4^x)}$

$$\begin{cases} x^{-x} \geq 9 \rightsquigarrow -x \geq 2 \rightsquigarrow x \leq -2 \\ 3x - 4^x \geq 0 \rightsquigarrow x \leq \frac{4}{3} \end{cases} \quad \left. \begin{array}{l} x \leq -2 \\ x \leq \frac{4}{3} \end{array} \right\} \text{هر دو منفی}$$

$D_f = (-\infty, -2] \cup [\frac{4}{3}, +\infty)$

ب) $\sqrt{x-1} + \sqrt{4+1} = 3 \rightsquigarrow \sqrt{x-1} - 3 = -\sqrt{4+1} \rightsquigarrow \sqrt{x-1} - 3 \leq 0 \rightsquigarrow \sqrt{x-1} \leq 3 \rightsquigarrow x-1 \leq 9 \rightsquigarrow x \leq 10$

$x \leq 12 \rightsquigarrow D_f = [1, 12]$

③ $x^x - x - 2 > 0 \rightsquigarrow \frac{-1}{(x+1)(x-2)} \left| \frac{-1}{x+1} \right| (-\infty, -1) \cup (2, +\infty)$

$$\sqrt{x^x - 1} + 1 \rightarrow x^x - 1 \geq 0 \rightarrow x^x \geq 1 \rightarrow x \geq 1, x \leq -1$$

$\hookrightarrow \sqrt{x^x - 1} + 1 \neq 0 \rightarrow \sqrt{x^x - 1} \neq -1 \checkmark$

④ $-x^x + ax + 3 > 0 \quad [x_1, x_2]$

$$\left. \begin{array}{l} a+b = \frac{3}{x} - \frac{1}{x} = 1 \end{array} \right\}$$

ضرب بشماره $= -3 \rightsquigarrow -2b = -3 \rightarrow b = \frac{3}{2}$

جمع بشماره $= -2 + \frac{3}{2} = -\frac{1}{2} = a$

Neger NO

$$\textcircled{2} \quad f(x) - x \geq 0 \rightarrow f(x) \geq x \quad \begin{matrix} x \geq 1 \\ x < 1 \end{matrix} \quad \left. \begin{matrix} 3x - x - x \geq 0 \rightarrow x \geq 1 \\ rx + \frac{r}{x} - x \geq 0 \rightarrow x \geq -r \end{matrix} \right\} D_f: [-r, +\infty)$$

$$\textcircled{3} \quad f(x) = rx^r - fx \sim rx(x-r) \quad \left. \begin{matrix} f(\sin \pi + \cos \pi) \\ \frac{\sqrt{r}}{r} + 1 \rightarrow \frac{r+\sqrt{r}}{r} \end{matrix} \right\} \rightarrow \frac{r+\sqrt{r}}{r} \left(\frac{-r+\sqrt{r}}{r} \right) = \frac{r-f}{r} = \frac{-1}{r}$$

$$\textcircled{4} \quad f(x) = \frac{x+1}{x-1}$$

$$f(a) = \frac{a+1}{a-1}, \quad f(f(a)) = \frac{f(a)+1}{f(a)-1} \rightarrow \frac{\frac{a+1}{a-1}+1}{\frac{a+1}{a-1}-1} \rightarrow \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a-1}{a-1}} = \frac{2a}{-2} = -a$$

$$\textcircled{5} \quad f(g(a)) = -f \quad g(a) = r \rightarrow \sqrt{a^r - 1} = r \rightarrow a^r - 1 = r^2$$

$$x^r - fx + r = 0 \quad (x-r)^r \sim x=r$$

$$\textcircled{6} \quad f(x+r) = x^r - ax + y$$

$$\left. \begin{matrix} x=1 \rightarrow f(1) = 1 - a + y = r \\ x=-y \rightarrow f(-r) = r^r + r^0 + y = \sqrt{r} \end{matrix} \right\} \text{iff}$$

$$\frac{r^0}{1} = \frac{y}{r}$$

$$\textcircled{7} \quad f(r \cos^r + a \cos) = \tan^r \rightarrow f\left(\frac{r}{\sqrt{r}}\right)$$

$$r \cos^r + a \cos = \frac{r}{\sqrt{r}} \quad \cos = t \quad rt^r + at = \frac{r}{\sqrt{r}} \rightarrow 1t^r + 1t - \sqrt{r} = 0 \rightarrow t = \frac{-1 \pm \sqrt{1+4\sqrt{r}}}{2}$$

$$\cos = \frac{1}{r} \rightarrow \frac{\tan^r}{\cos^r} = \frac{\sin^r}{\cos^r} = \frac{1}{\frac{1}{r}} = r$$