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$$f(x) = \left(\frac{1}{x}\right)^{x-r} = r^{r-x} \quad y = \sqrt{x^r f(x+1)} \rightarrow \sqrt{x^r x^{r-x-1}} = \sqrt{x^{1-x}}$$

$$x^{1-x} > 0 \rightarrow r^{1-x} \rightarrow +\infty \Rightarrow 0 \text{ شماره} \rightarrow \frac{0}{-} \Rightarrow Dy = [0, +\infty)$$

$$f(x) = \sqrt{x+1} \rightarrow f(-x) = \sqrt{-x+1} \rightarrow 1-x \geq 0$$

$$Dy = (-\infty, 1] \Leftrightarrow -2x+2 \geq 0 \Rightarrow x \leq 1$$

$$y = \sqrt{\frac{x-1}{f(x)}} \rightarrow \frac{x-1}{f(x)} \geq 0$$

$$Dy = (-\infty, 1] \cup (r, \infty)$$

$$y_1 = \frac{1}{(x^r - 1)^r - x^r - r} \rightarrow \frac{1}{(x^r - 1)^r - x^r - r - \varepsilon} \rightarrow \frac{1}{(x^r - 1)^r - (x^r + r + \varepsilon)}$$

$$(x^r - 1)^r - (x^r + r + \varepsilon) \neq 0 \rightarrow (x^r - 1 + x + r)(x^r - 1 - x - r) \rightarrow Dy_1 = R_1 - \{\text{شماره}\} \quad I$$

$$y = \frac{1}{r x^r + a x + b} \rightarrow Dy = R_1 - \{\text{شماره}\} \xrightarrow{I} I, II \Rightarrow r x^r - x - r = r x^r + a x + b \rightarrow a = -1, b = -r$$

$$f(x) = x^r + x \quad \sqrt{f(x) - f\left(\frac{r}{x}\right)} \rightarrow x^r + x - \frac{r^r}{x^r} - \frac{r}{x} \geq 0$$

$$\left(x^r - \frac{r^r}{x^r}\right)\left(x - \frac{r}{x}\right) \geq 0 \rightarrow \left(x - \frac{r}{x}\right)\left(x^r + \frac{r^r}{x^r} - \frac{14}{x^r}\right) \geq 0$$

$$\left(x - \frac{r}{x}\right)\left(x^r + \frac{r^r}{x^r} - \frac{14}{x^r}\right) \geq 0 \rightarrow x^r - r = 0 \rightarrow x^r = r \rightarrow x = \pm \sqrt[r]{r}$$

$$Dy = R_1 - (-r, r)$$

$$f(x^r + x) = rx^r - 1 \rightarrow f(r) \rightarrow x^r + x = r \rightarrow x=1, = r-1=1 \quad -9$$

$$\rightarrow f(1) \rightarrow x^r + x = 1 \rightarrow x=r, = 1-1=0$$

$$1+1=2$$

$$f(x) = x^r - 9x^r + 12x \xrightarrow{\pm 1} x^r - 9x^r + 12x + 1 = (x-r)^r \rightarrow (x-r)^r + 1 \quad -7$$

$$g(x) = x^r + 9x^r + rvx \xrightarrow{\pm rv} x^r + 9x^r + rvx + rv = (x+r)^r \rightarrow (x+r)^r - rv$$

$$g(\sqrt[r]{v}-r) \rightarrow (\sqrt[r]{v}-r)^r - rv = -rv$$

$$f(\sqrt[r]{r}+r) \rightarrow (\sqrt[r]{r}+r)^r + 1 = 1 \rightarrow \frac{-r}{1} = -r$$

$$f(x) = \sqrt{x+\varepsilon}\sqrt{x-\varepsilon} \rightarrow \sqrt{(\sqrt{x-\varepsilon}+r)^2} = |\sqrt{x-\varepsilon}+r| = \sqrt{x-\varepsilon}+r \quad -8$$

$$g(x) = \sqrt{x-\varepsilon}\sqrt{x+\varepsilon} \rightarrow \sqrt{(\sqrt{x-\varepsilon}-r)^2} = |\sqrt{x-\varepsilon}-r| \xrightarrow{x \geq 1} \sqrt{x-\varepsilon}-r$$

$$\xrightarrow{r < x < 1} -\sqrt{x-\varepsilon}+r$$

$$x \geq 1 \rightarrow 0 + r\sqrt{x-\varepsilon} \rightarrow \frac{-1}{r}$$

$$\varepsilon < x < 1 \rightarrow r + 0 \rightarrow -1$$

$$Dg = \{r, 1, r, 0\}, \rightarrow Df \Rightarrow \frac{x+r}{x^r - rx + r} \rightarrow x^r - rx + r \neq 0 \rightarrow (x-1)(x-r) \quad -9$$

$$\Rightarrow Df = \mathbb{R}_+ - \{1, r\}$$

$$r, 0 \rightarrow \text{مسترب} \rightarrow f(r) = \frac{\varepsilon}{-1} = -\varepsilon$$

$$\rightarrow f(0) = \frac{r}{r} \rightarrow \frac{g}{f} = \left\{ (r, -\frac{1}{\varepsilon}), (0, r) \right\}$$

$$f(rx) \rightarrow \left\{ \left(\frac{1}{r}, r\right), \left(\frac{r}{r}, -1\right), (r, r), \left(-\frac{1}{r}, r\right) \right\} \quad -10$$

$$f(x^r) \rightarrow \left\{ (1, r), (-1, r), (\sqrt{r}, -1), (-\sqrt{r}, -1), (r, r), (-r, r) \right\}$$

$$rg^r(x)+1 \rightarrow \left\{ (-r, 1), (1, r), (r, r), (-1, 1) \right\}$$

$$\frac{rf}{g} \rightarrow \left\{ (1, -\varepsilon), (r, -1), (-1, \cancel{0}) \right\}$$

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