

Subject:

18, 150

سینا استیلا - یزید دفر - ساره سیف

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

1, 150

$$x^x (x^{1-x} - 1) \geq 0$$

$$x^{1-x} - 1 = 0 \rightarrow x^{1-x} = 1 \rightarrow x = 1$$

$$D_f = \mathbb{R} - \{0, 1\}$$

$D_f = [1, 1]$

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

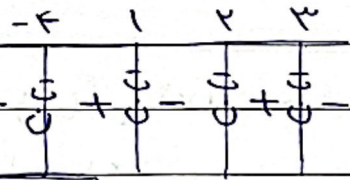
$$1-x \geq x \rightarrow 1 \geq 2x$$

$$1-x \leq -x \rightarrow 1 \leq 0 \rightarrow \text{میان نیست}$$

$$D_f = (-\infty, 1]$$

5

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



$$D_f = [-1, 1] \cup (2, 3)$$

5

$D_{f_1} = D_{f_2} = \mathbb{R} - \{z\}$ - ریشه ها 2 معادله برابر است چون در خارج قرار دارند و تنها 2 نبوده در داخله این تابع صفر شدن خارج است

5

$$9x^2 - 4x^2 - x^2 - 4x - 4 + 1$$

$$(9x^2 - 4x^2 + 1) - x^2 - 4x - 4$$

$$(5x^2 - 1)^2 - (x+2)^2$$

$$(5x^2 - 1)^2 - (x+2)^2 \neq 0 \rightarrow 5x^2 - 1 = x+2 \rightarrow 5x^2 - x - 3 = 0$$

$$5x^2 - x - 3 = 0 \rightarrow 5x^2 - x - 3 = 5x^2 + ax + b \rightarrow a = -1$$

$$b = -3$$

$$\sqrt{-(a+b)} = \sqrt{4} = 2$$

IDEA

Subject:

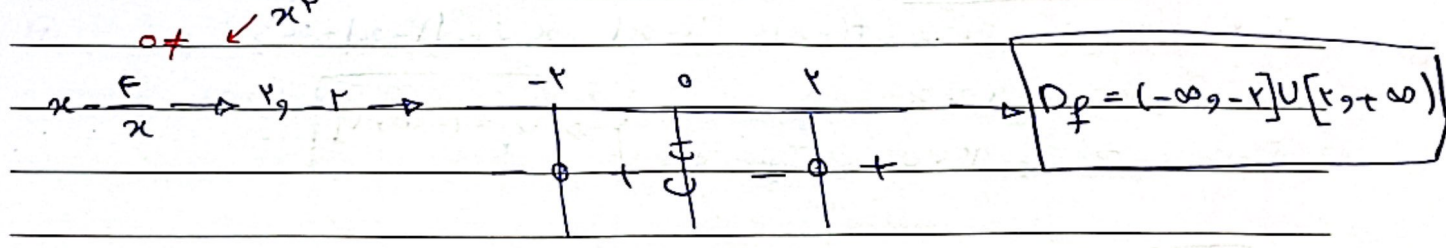
②

$$f(x) = x^4 + x \quad y = \sqrt{f(x) - f\left(\frac{r}{x}\right)} \rightarrow f(x) - f\left(\frac{r}{x}\right) \geq 0 \rightarrow$$

$$f(x) \geq f\left(\frac{r}{x}\right) \rightarrow x^4 + x \geq \frac{r^4}{x^4} + \frac{r}{x} \rightarrow x^4 - \frac{r^4}{x^4} \leq x - \frac{r}{x}$$

$$\left(x - \frac{r}{x}\right) \left(x^4 + \frac{14r}{x^2} + r\right) + x - \frac{r}{x} \geq 0 \rightarrow x^5 + \frac{14r}{x^2} + r + 1 \geq 0 \quad (1/2)$$

$$(x^5 + 14r + \omega x^2) \left(x - \frac{r}{x}\right) \geq 0 \rightarrow + \text{min}$$



③

$$f(x^4 + x) = rx^2 - 1 \rightarrow f(r) + f(10) =$$

$$\begin{cases} x^4 + x = r \rightarrow x = 1 \rightarrow rx^2 - 1 = 1 \\ x^4 + x = 10 \rightarrow x = 2 \rightarrow rx^2 - 1 = 4 \end{cases} \rightarrow f(r) + f(10) = 1 + 4 = 5$$

④

$$f(x) = x^4 - 4x^2 + 15x$$

$$f(\sqrt[3]{r} + r) = (r + 1 + 4\sqrt[3]{r} + 15\sqrt[3]{r}) - 4(\sqrt[3]{r} + r\sqrt[3]{r}) + 15(\sqrt[3]{r} + r) = 10$$

⑤

$$g(x) = x^4 + 9x^2 + 2Vx$$

$$g(\sqrt[3]{V} - 1) = (V - 2V - 9\sqrt[3]{V} + 2V\sqrt[3]{V}) + 9(\sqrt[3]{V} - 9\sqrt[3]{V} + 9)$$

$$+ 2V(\sqrt[3]{V} - 1) = V - 2V - 20$$

$$\rightarrow \frac{g(\sqrt[3]{V} - 1)}{f(\sqrt[3]{r} + r)} = \frac{-20}{10} = -2$$

IDEA

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

(1)

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

(5)

$$g(x) = \sqrt{(x-f) - f} \sqrt{x-f + f} \rightarrow g(x) = |\sqrt{x-f} - r|$$

$$f(x) + g(x) = a + b\sqrt{x+c} \quad f \leq x < 1 \rightarrow \sqrt{x-f} + r + r - \sqrt{x-f} = f$$

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

$$0 + r\sqrt{x-f} = a + b\sqrt{x+c} \rightarrow \begin{matrix} a+b \\ c \end{matrix} = \begin{matrix} 0+r \\ -f \end{matrix} = \begin{matrix} -1 \\ r \end{matrix}$$

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

(4)

$$\begin{matrix} x+r \\ x^r - fx + r \end{matrix} \neq 0 \rightarrow \begin{matrix} -r \\ 1, r \end{matrix}$$

$$f(r) = -f$$

$$f(0) = \frac{r}{r}$$

(5)

$$g_f = \left\{ \left(r, -\frac{1}{r} \right), (0, r) \right\}$$

$$f(x) = \left\{ \left(\frac{1}{f}, r \right), \left(\frac{r}{r}, -1 \right), (r, r), \left(-\frac{1}{r}, r \right) \right\}$$

(10)

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

(1, 5)

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

IDEA

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

10. ب)

$$\begin{cases} x^r = 1 \rightarrow x = \pm 1 \\ x^r = r \rightarrow x = \pm \sqrt{r} \\ x^r = f \rightarrow x = \pm r \\ x^r = -1 \rightarrow x \end{cases}$$

$$\rightarrow \left\{ (\pm 1, r), (\pm \sqrt{r}, -1), (\pm r, r) \right\}$$

$$\frac{(a^L r)(a^r + a^r + 14)}{a^r} \approx$$

$$Df = [-r, \cdot) \cup (r, \infty)$$

(5)

$$\begin{array}{c} -\infty \qquad \qquad \qquad \infty \\ - \quad + \quad - \quad + \quad - \quad + \end{array}$$