

۱۹,۲۵ آفتاب

پارسه زندی

$$f(x+2) = \begin{cases} 4x+2 & x \geq 1 \\ 4x-1 & x < 1 \end{cases}$$

$$y = \sqrt{f(3-x) - f(x+1)}$$

سوال ۱

$$f(3-x) - f(x+1) \geq 0 \Rightarrow f(3-x) \geq f(x+1) \Rightarrow 3-x \geq x+1 \Rightarrow \boxed{x \leq 1}$$

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$$f(x) = \begin{cases} 4(x+2)+2 & x+2 \geq 1 \Rightarrow x \geq -1 \\ 4(x+2)-1 & x+2 < 1 \Rightarrow x < -1 \end{cases}$$

$$f(x) = (x^3 + x)^3 \quad \text{for } f(x) < f(x^3)$$

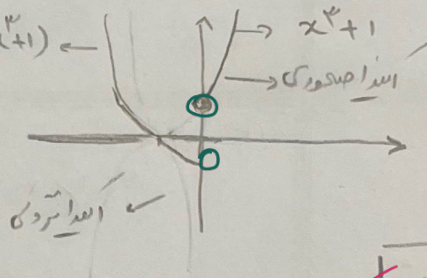
سوال ۲

$$f(f(x)) < f(x^3) \Rightarrow f(x) < x^3 \Rightarrow x^3 > (x^3 + x)^3 \Rightarrow x > x^3 + x \Rightarrow x^3 < 0 \Rightarrow \boxed{x < 0}$$

انبار

در دامنه مثبت

$$f(x) = |x| \left(x^3 + \frac{1}{x} \right) = \begin{cases} x^3 + 1 & x > 0 \\ -x^3 - 1 & x < 0 \end{cases}$$



سوال ۳

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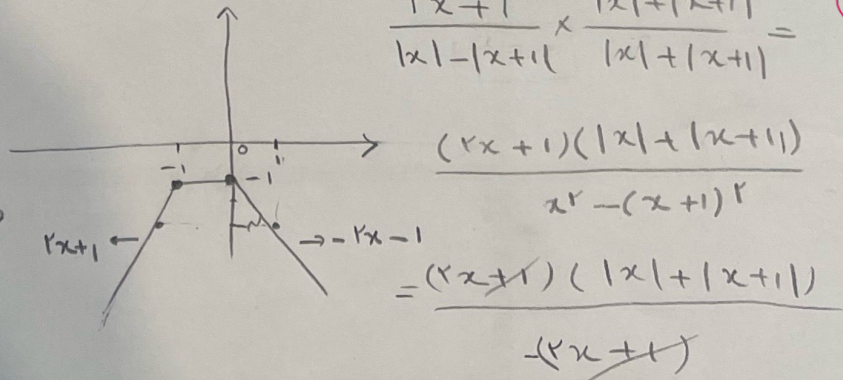
خبرنگار

$$f(x) = \frac{x+1}{|x| - |x+1|} \quad (-\infty, \alpha] \quad \alpha_{\max} = ?$$

سوال ۴

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$$\left. \begin{aligned} \frac{x+1}{x-x-1} &= -(x+1) & x > 0 \\ \frac{x+1}{-x-x-1} &= \frac{x+1}{-2x-1} & -1 \leq x \leq 0 \\ \frac{x+1}{-x-(-x-1)} &= \frac{x+1}{1} & x < -1 \end{aligned} \right\} \Rightarrow$$



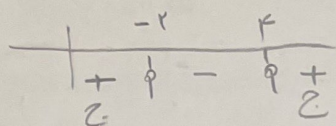
$$\Rightarrow \boxed{\alpha \leq 0}$$

$$= -(|x| + |x+1|)$$

$$y = \log_{\frac{1}{r}} (x^2 - 2x - 1)$$

$$x^2 - 2x - 1 > 0 \quad (x-4)(x+2) > 0$$

سؤال ٥



$$\begin{cases} x < -2 \\ x > 4 \end{cases}$$

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$$x > 4 \rightarrow \log_{\frac{1}{r}} (x^2 - 2x - 1) \Rightarrow \text{صورتی است} \checkmark$$

$$y = \log_{\frac{1}{r}} (x^2 - 2x - 1) = -\log_r (x^2 - 2x - 1)$$

$$x < -2 \rightarrow x^2 - 2x - 1 \Rightarrow \text{تزیلی است } x$$

$$\Rightarrow \log_{\frac{1}{r}} (x^2 - 2x - 1) \rightarrow \text{باید تزیلی باشد}$$

$$\boxed{x < -2} \quad \checkmark$$

$$f(x) = (a^x - 3)^x$$

سؤال ٤

$$a^x - 3 > 1 \Rightarrow a^x > 4 \Rightarrow \boxed{a > 2 \cup a < -2}$$

این تابع f صورتی است

$$a^x - 3 \geq 1 \Rightarrow a^x \geq 4 \Rightarrow \boxed{a > 2 \cup a \leq -2}$$

ب. این تابع f صورتی است.

$$\underline{\text{نکته}} \quad x_1 < x_2 \Rightarrow f(x_1) \leq f(x_2) \Rightarrow a^x - 3 = 0 \Rightarrow a^x = 3 \Rightarrow \boxed{a = \pm \sqrt{x}}$$

$$f(x) = x^3 + ax^2 + bx + c$$

$$(-3, -1)$$

$$y = |f(x)| \rightarrow (k, +\infty) \text{ است}$$

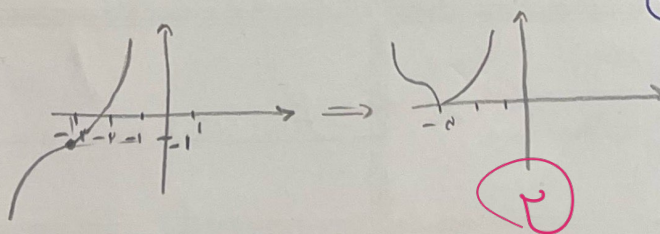
$$(x+3)^3 \rightarrow (x+3)^3 = 1$$

$$y = |f(x)| \rightarrow y = |(x+3)^3 - 1|$$

$$|(x+3)^3 - 1| = 0 \rightarrow (x+3)^3 - 1 = 0$$

$$(x+3)^3 = 1 \xrightarrow{\sqrt[3]{}} x+3 = 1 \rightarrow \boxed{x = -2}$$

$$\Rightarrow \boxed{x = -2}$$



سؤال ٧

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

$$\sqrt{x} = t \Rightarrow t^2 + t - 2 \quad / \Delta > 0 \quad \text{احتمال صوری}$$

شماره ۸
۱, ۲, ۵

$$f \circ f(x) \leq f(x)$$

$$f \circ f(x) \leq f(\sqrt{x}) \Rightarrow f(x) \leq \sqrt{x} \Rightarrow x + \sqrt{x} - 2 \leq \sqrt{x} \Rightarrow x - 2 \leq 0 \Rightarrow x \leq 2$$

$$\sqrt{x} \Rightarrow x \geq 0 \quad 0 \leq x \leq 2 \Rightarrow$$

$$\left[-\frac{1}{2}, \frac{1}{2} \right] \quad [0, 1, 2]$$

$$D f \circ f \rightarrow D f \in D f \rightarrow u + \sqrt{u} - 2 \geq 0 \rightarrow (\sqrt{u} + 1)(\sqrt{u} - 1) \geq 0 \rightarrow u \geq 1 \rightarrow 1 \leq u \leq 2$$

$$f(x) = r \sqrt[3]{4 \cos^2 x - 1} - r \sqrt[3]{1 - 4 \cos^2 x} \quad [a, b] \quad b - a = ?$$

$$-1 \leq \cos^2 x \leq 1 \rightarrow -1 \leq 4 \cos^2 x \leq 4 \Rightarrow -1 \leq 4 \cos^2 x - 1 \leq 3 \Rightarrow 1 \leq \sqrt[3]{4 \cos^2 x - 1} \leq 3$$

$$\Rightarrow \sqrt[3]{4 \cos^2 x - 1} = t$$

$$f(t) = r t^3 - r^{-t} \quad -1 \leq t \leq 3$$

$$\Rightarrow R f(t) = [f(-1), f(3)] \rightarrow \left[-\frac{r}{F}, \frac{15}{F} \right] \Rightarrow b - a = \frac{r}{F}$$

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$$f(x) = x - [x + r] \quad g(x) = \frac{r^x - r^{-x}}{r} \quad R g \circ f = ?$$

$$f(x) = x - [x + r] = x - [x] - r \quad \begin{cases} -r & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases}$$

$$\left\{ \begin{array}{l} \frac{r^{-r} - r^r}{r} = -\frac{15}{r} \\ \frac{r^{-1} - r^1}{r} = -\frac{r}{F} \end{array} \right. \Rightarrow$$

$$R g \circ f = \left[-\frac{15}{r}, -\frac{r}{F} \right]$$

۱۰, ۱۱, ۱۲

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