

۱. تابع  $f(x)$  در بازه  $[1, 3]$

$$f(x) = 1 - \frac{a}{x} \quad [1, 3]$$

میانگین تغییرات:  $\frac{f(3) - f(1)}{3 - 1} = \frac{1 - \frac{a}{3} - (1 - a)}{2} = \frac{\frac{2}{3}a}{2} = \frac{a}{3}$

$$f'(x) = \frac{a}{x^2} \Rightarrow \frac{a}{x^2} = \frac{a}{3} \Rightarrow x^2 = 3 \Rightarrow x = \pm\sqrt{3}$$

$g(x) = \frac{1}{2}ax^2 - \frac{a}{x}$   $g'(x) = 1$   $\Rightarrow \beta$   $a = (-\frac{b}{2a})$

$\frac{1}{2}ax^2 - \frac{a}{x} = 0 \Rightarrow ax^2 - \frac{2a}{x} = 0$   
 $\frac{1}{2}ax^2 - \frac{a}{x} + \frac{1}{2}ax^2 = 0 \Rightarrow ax^2 - \frac{2a}{x} + \frac{1}{2}ax^2 = 0$   
 $\Delta = 0 \Rightarrow 4 - 4(a)(\frac{2}{a}) = 0$   
 $4 - 8 = 0 \Rightarrow a = -\frac{1}{2}$

$g(x) = x^2 - 12x + 1 \rightarrow \min$

$g'(x) = 2x - 12 = 0 \Rightarrow x = 6 \Rightarrow a = \pm 12$

$x$	$-12$	$6$	
$g'$	$+$	$-$	$+$
$g$	$\nearrow$	$\searrow$	$\nearrow$

$\Rightarrow \min(12, -12)$

$g(x) = x^2 + ax^2 - bx - 1$   $\Rightarrow \max$   $x > 0$

$g'(x) = 2ax^2 + 2ax - b = 0$   $x = -1$

$x = -1 \Rightarrow -2a - b = 0 \Rightarrow b = -2a$   
 $x = -1 \Rightarrow 2a - 2a - b = 0 \Rightarrow b = 0$

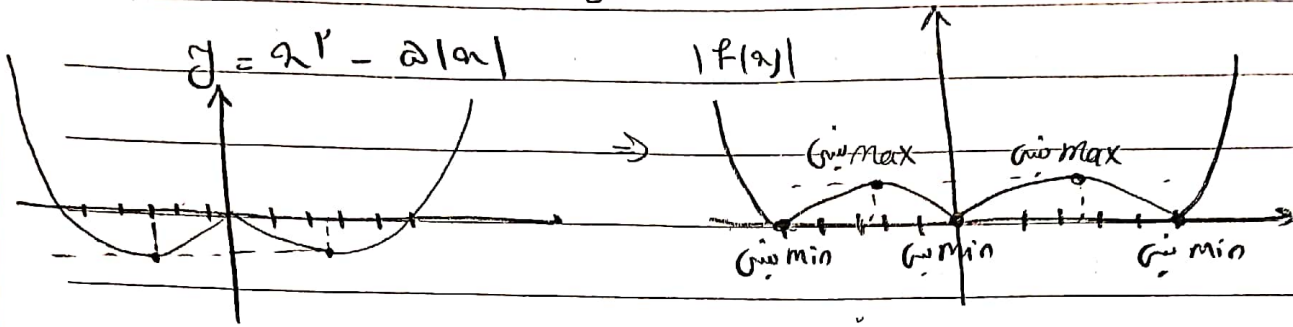
$A(0, -1)$

$B(-1, 0)$

$\Rightarrow |AB| = \sqrt{1 + 1} = \sqrt{2} = \sqrt{2}$

$$f(a) = a^r - a|a| \quad \begin{matrix} \text{Global Max: } m \\ \text{Global Min: } n \end{matrix} \Rightarrow \begin{matrix} n^r \\ m^r \end{matrix} = \frac{r}{r}$$

$$|f(a)| = |a^r - a|a||$$



$$y = |f(a)|, \quad f(a) = a(|a| + r)$$

$$y = |a(|a| + r)|$$

$$|a| = 0 \Rightarrow a = 0 \quad \left\{ 0, -r, -\frac{r}{2} \right\}$$

$$a^r + r a = 0 \Rightarrow a = -r$$

$$y = a^r + r a \Rightarrow y' = r a^{r-1} + r \Rightarrow a = -\frac{r}{r}$$

$$f(a) = \sqrt[r]{a^r} |a - a| \quad [0, a] \text{ max } = 1/a \quad a > 0$$

$$f(a) = \sqrt[r]{a^r} (a - a)$$

$$f'(a) = \frac{r}{r \sqrt[r]{a}} (a - a) + \sqrt[r]{a^r} = 0$$

$$\frac{r}{r \sqrt[r]{a}} (a - a) = -\sqrt[r]{a^r} \Rightarrow r(a - a) = -r a$$

$$r a - r a = -r a \Rightarrow 0 a = -r a \rightarrow a = \frac{r}{r}$$

$$\frac{r \sqrt[r]{a^r}}{r \sqrt[r]{a}} \left| \frac{-r}{a} a \right| = 1/a \rightarrow \frac{r a^r}{r a} \times \frac{r}{r a} = \frac{r}{r}$$

$$a^0 = \frac{r \text{ max } 1/a}{r} = \frac{a^0}{r} \Rightarrow e_1 = 1/a$$

$$D_f: a^r - a \neq 0$$

$$a(a-1) \neq 0 \Rightarrow \frac{1}{+ \quad - \quad - \quad +}$$

$$f(a) = \sqrt{a|a| - a}$$

$$m: \text{سبب max} \quad \left\{ \begin{array}{l} \frac{km+n}{k-a} \Rightarrow ? \\ k-a \end{array} \right.$$

$$n: \text{سبب min}$$

$$k: \text{مخرج}$$

$$f(a) = \begin{cases} \sqrt{a^r - a} & a \geq 1 \\ \sqrt{-a^r - a} & a \leq 0 \end{cases}$$

\* تعادلتا طبعاً

\* م: ا سبب

$$f'(a) = \begin{cases} \frac{ra-1}{r\sqrt{a^r a}} & a > 1 \\ -ra-1 & a < 0 \end{cases}$$

$$\max \text{ سبب} \rightarrow m=1$$

$$\Rightarrow \frac{km+n}{k-a} = \frac{f(1)}{\frac{1}{r}} = \frac{1}{r}$$

$$y = \frac{ma+r}{a-l+m}$$

$$(1, +\infty) \rightarrow \text{مخرج} \quad a$$

$$y' = \frac{m(a-l+m) - (ma+r)}{(a-l+m)^2}$$

$$\frac{m^2 - m + m^2 - ma - r}{(a-l+m)^2} < 0$$

$$m^2 - m - r < 0$$

$$(m-r)(m+1) < 0 \Rightarrow m \in \mathbb{Z}: \{0, 1\}$$

$$f(a) = \frac{a}{1-a|a|} \quad a|a| \neq 1 \Rightarrow D \neq \emptyset$$

$$a \neq 1$$

$$|a| \geq 0 \Rightarrow a \geq 0$$

$$f(a) = \frac{a}{1-a^r} \Rightarrow f'(a) = \frac{1-a^r - (-ra)(a)}{(1-a^r)^2}$$

$$f'(a) = \frac{a^r - 1}{(1-a^r)^2} \Rightarrow a = \pm 1 \Rightarrow a = -1$$