

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

(1)

$$y = \frac{ra}{r} - an + na \rightarrow y' = \frac{ra}{r} - a \xrightarrow{y=a} ra = 1 \rightarrow a = \frac{1}{r}$$

(2)

$$y = a^x - rx + r \rightarrow y' = \frac{ra}{r} - r \rightarrow \frac{ra}{r} = r \rightarrow a = \pm r$$

min = (r, -1/r)

نقطه minimum

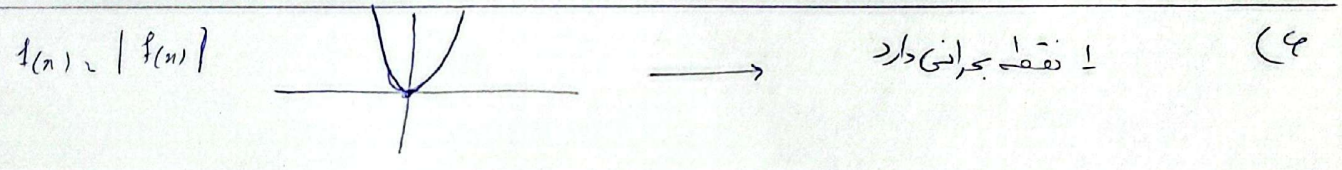
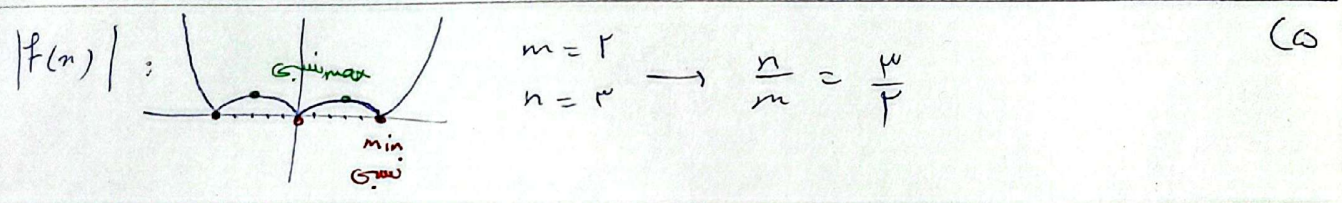
y'	+	0	-	+
y		↗	↘	↗

(3)

$$y = x^k + ax^r - rbx - f \rightarrow y' = kx^{k-1} + rax - rb \xrightarrow{x=-r} -rb = 0 \rightarrow b = 0$$

(4)

(0, f), (-r, 0) → Job = √(f+14) = r√δ



$$f(x) = |x^{\frac{a}{r}} - ax^{\frac{r}{r}}| \rightarrow f'(x) = \frac{ra}{r} x^{\frac{a}{r}-1} - \frac{ra}{r} x^{-\frac{1}{r}} \rightarrow \frac{1}{r} x^{-\frac{1}{r}} (ax - 1) = 0 \rightarrow x = \frac{ra}{a}$$

(7)

$$f(\frac{ra}{a}) = \frac{r}{r} \rightarrow \sqrt{\frac{ra^r}{ra}} \left| \frac{ra}{a} - a \right| = \frac{r}{r} \rightarrow \frac{ra^r}{ra} \times \frac{ra^r}{ra} = \frac{r}{r} \rightarrow a^a = \left(\frac{a}{r}\right)^a \rightarrow a = \frac{a}{r}$$

$$f(x) = \begin{cases} \sqrt{x^2-n} & x > 0 \\ \sqrt{-x^2-n} & x < 0 \end{cases} \rightarrow f'(x) = \begin{cases} \frac{x-1}{\sqrt{x^2-n}} & x > 0 \\ \frac{-x-1}{\sqrt{-x^2-n}} & x < 0 \end{cases}$$

(8)

	-1	-1/r	0
y'	+	0	-
y		↗	↘

$$\frac{km+n}{k-n} = \frac{r}{r} = 1$$

m=1 ← نقطه maximum

k=f ← {اره، -1/r}

n=0 ← نقطه minimum

(9)

$$y' = \frac{m^r - m - r}{(m+m-1)^r} \leq 0 \rightarrow (m-r)(m+1) \leq 0 \quad \frac{-1}{+4} - \frac{r}{+1} \rightarrow m \in [-1, r] \quad (9)$$

$\xrightarrow{\text{موجب, سالب, موجب}}$

$$f(x) = \frac{x}{1-x/2} \rightarrow f(x) \begin{cases} \frac{x}{1-x^r} & x > 0 \\ \frac{x}{1+x^r} & x < 0 \end{cases} \rightarrow f'(x) = \begin{cases} \frac{x^r + 1}{(1-x^r)^r} & x > 0 \\ \frac{1-x^r}{(1+x^r)^r} & x < 0 \end{cases}$$

$$f'(x) = 0 \rightarrow 1-x^r = 0 \rightarrow x = \pm 1 \rightarrow \text{نقطه بحرانی}$$