

$$\frac{f(x) - f(1)}{x - 1} \rightarrow \frac{(1 - \frac{a}{x}) - (1 - a)}{x - 1} = \frac{\frac{a}{x} - a}{x - 1} = \frac{a}{x} \left[\text{آهنگ متوسط} \right]$$

$$f(x) = 1 - \frac{a}{x} \xrightarrow{\text{مشتق}} f'(x) = \frac{a}{x^2} \left[\text{آهنگ متوسط} \right]$$

$$\frac{a}{x} = \frac{a}{x^2} \rightarrow x^2 = x \rightarrow x = \pm \sqrt{a}$$

در $x = \sqrt{a}$ (مورد اول) $f(x) = 1 - \frac{a}{\sqrt{a}} = 1 - \sqrt{a}$ و در $x = -\sqrt{a}$ $f(x) = 1 - \frac{a}{-\sqrt{a}} = 1 + \sqrt{a}$

در $x = \sqrt{a}$ $f'(x) = \frac{a}{(\sqrt{a})^2} = \frac{a}{a} = 1$

$$2ax^2 - 2x + 11a = 0 \rightarrow 2ax^2 - 2x + 11a = 0 \xrightarrow{\div 2} ax^2 - x + 11a = 0$$

$$ax^2 - x + 11a = 0 \xrightarrow{\Delta=0} 1 - 4(a)(11a) = 0 \rightarrow 1 - 44a^2 = 0 \rightarrow a^2 = \frac{1}{44} \rightarrow a = \pm \frac{1}{\sqrt{44}} \rightarrow a = \frac{1}{\sqrt{44}}$$

$$a = \frac{1}{\sqrt{44}} \rightarrow \text{در } x = \frac{1}{\sqrt{44}} \rightarrow x^2 - 2x + 11 = (x - 1)^2 = 0 \rightarrow \text{نقطه نشیمن است}$$

$$y = 3x^2 - 12 \rightarrow 6x - 12 = 0 \rightarrow x = 2 \rightarrow y = 3(2)^2 - 12 = 0$$

	-2	2
f'	+	-
f	↗	↘

↘ min

$$y = x^2 - 12x + 12 \xrightarrow{x=2} 1 - 24 + 12 = -11$$

$$y = x^2 + ax^2 - 2bx - c \rightarrow y' = 2x + 2ax - 2b$$

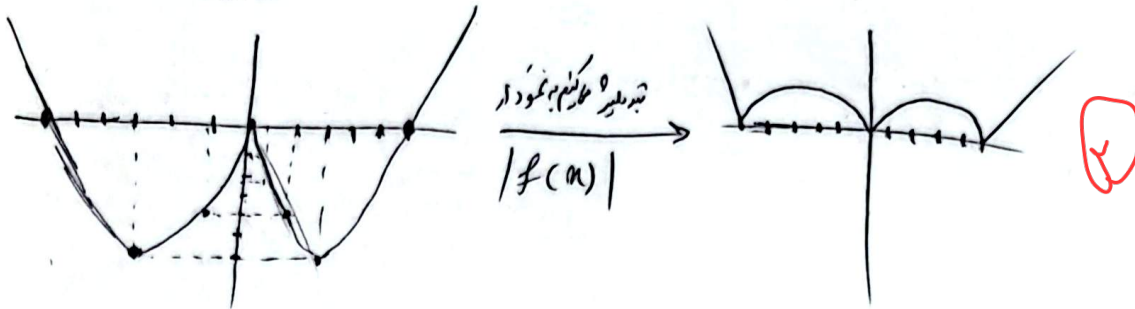
$$y = x^2 + 2x^2 - 4 = 3x^2 - 4$$

$$\begin{cases} x=2 \rightarrow -2b=0 \rightarrow b=0 \\ x=2 \rightarrow 12-4a=0 \rightarrow 4a=12 \rightarrow a=3 \end{cases}$$

$$\begin{vmatrix} 0 & -2 \\ -4 & -12 \end{vmatrix} \rightarrow \begin{vmatrix} 1 & -2 \\ 1 & -4 \end{vmatrix} \rightarrow \sqrt{14 + 4} = \sqrt{18} = 3\sqrt{2}$$

$$f(n) \begin{cases} n^2 - 5n & n > 0 \\ n^2 + 5n & n < 0 \end{cases}$$

عدد $f(n)$

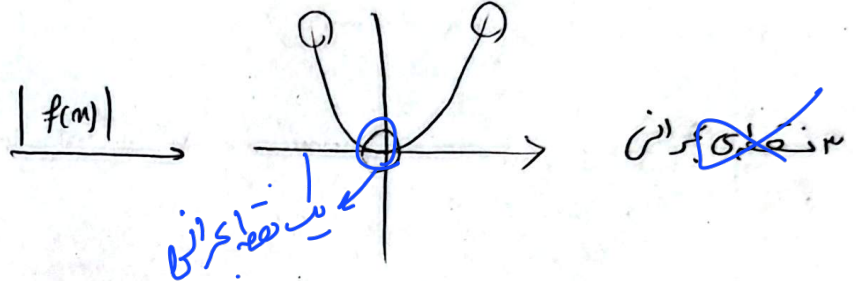
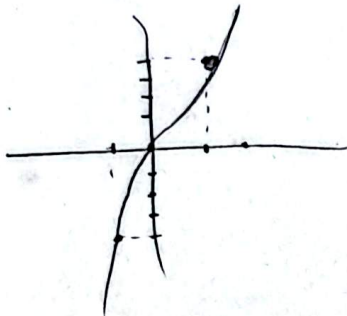


$m \rightarrow$ تعداد نقاط صفری $= 2$
 $n \rightarrow$ تعداد نقاط صفری $= 2$

$\frac{n}{m} = ? \rightarrow \frac{2}{2} = 1 \neq 1.18$

$$f(n) = n(|n| + 3)$$

$$f(n) = \begin{cases} n^2 + 3n & n > 0 \\ -n^2 + 3n & n < 0 \end{cases}$$



1.18

$$f(n) = \sqrt[n]{n^2} (a-n) = a n^{\frac{2}{n}} - n^{\frac{2}{n}} \rightarrow f'(n) = \frac{2}{n} a n^{-\frac{1}{n}} - \frac{2}{n} n^{\frac{2}{n}-1}$$

$$\rightarrow \frac{2}{n} n^{-\frac{1}{n}} (a - \frac{2}{n} n) \rightarrow f'(n) = \frac{2(a - \frac{2}{n} n)}{n^2 \sqrt[n]{n}}$$

نقاط بحرانی

$$f(\frac{2}{3}a) = 110 \Rightarrow \sqrt[\frac{2}{3}]{(\frac{2}{3}a)^2} (a - \frac{2}{3}a) = \frac{110}{3} \rightarrow \frac{2}{3} a^{\frac{3}{2}} \times \frac{2}{3} a^{\frac{2}{3}} = \frac{110}{3}$$

$$\frac{2a^{\frac{5}{6}}}{3} = \frac{110}{3} \rightarrow a^{\frac{5}{6}} = \frac{110}{2} \rightarrow a = \frac{110}{2}^{\frac{6}{5}} \rightarrow a = 215$$

2

