

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

$$f(x) = 1 - \frac{a}{x} \xrightarrow{\text{مشتق}} f'(x) = \frac{a}{x^2}$$

$$\frac{a}{x} = \frac{a}{x^2} \rightarrow x^2 = x \rightarrow x = \pm \sqrt{x} \rightarrow \boxed{x = \sqrt{3}}$$

در $x = \sqrt{3}$ مقدار $f(x)$ را محاسب می‌کنیم: $f(\sqrt{3}) = 1 - \frac{a}{\sqrt{3}}$

(۲)

$$y' = 3x^2 - 12 \rightarrow 3x^2 - 12 = 0 \rightarrow x^2 = 4 \rightarrow x = \pm 2$$

	-2	2
f'	+	-
f	↗	↘

↘ min ↗

$$y = x^3 - 12x + 12 \xrightarrow{x=2} 8 - 24 + 12 = -4$$

(۳)

$$y = x^3 + ax^2 - 2bx - c \rightarrow y' = 3x^2 + 2ax - 2b$$

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

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

$$12+4a=0 \rightarrow 4a=-12 \rightarrow a=-3$$

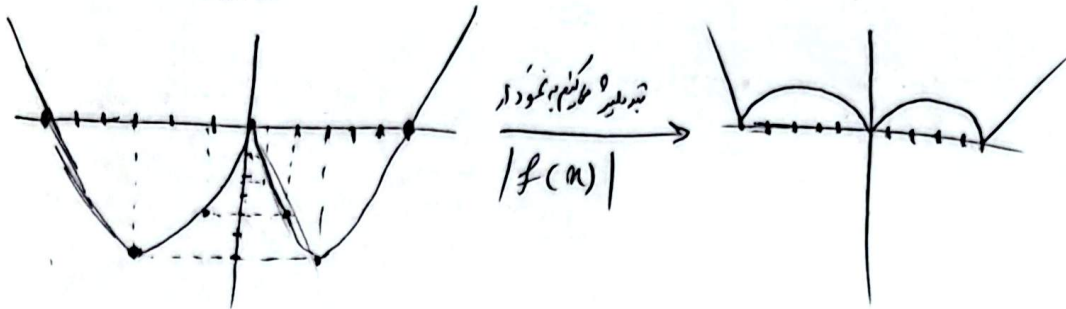
$$\begin{vmatrix} 0 & -2 \\ -4 & -12+4a-2c \end{vmatrix}$$

$$\rightarrow \begin{vmatrix} 0 & -2 \\ -4 & -12 \end{vmatrix}$$

$$\sqrt{16 + 4} = 2\sqrt{5}$$

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

عدد $f(x)$

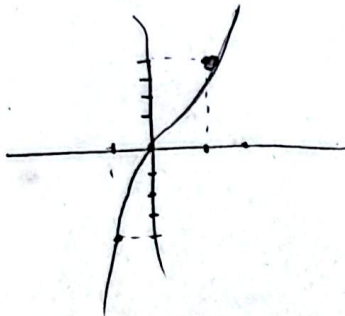


$m \rightarrow$ تعداد نقاط مبني $= 2$
 $n \rightarrow$ تعداد نقاط مبني $= 2$

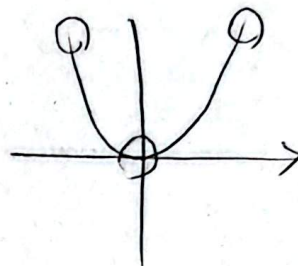
$$\rightarrow \frac{n}{m} = 1 \rightarrow \frac{2}{2} = 1$$

$$f(x) = x(|x| + 2)$$

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



$|f(x)|$



نقطه مبني

$$f(x) = \sqrt[3]{x^2} (a-x) \rightarrow f'(x) = \frac{2}{3} a x^{-1/3} - \frac{2}{3} x^{2/3}$$

$$\rightarrow \frac{2}{3} x^{-1/3} (a - \frac{2}{3} x) \rightarrow f'(x) = \frac{2(a - \frac{2}{3} x)}{3 \sqrt[3]{x}}$$

نقاط مبني $n = \frac{2}{3} a$

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

توان 3

$$\frac{2}{3} a^2 \times \frac{2}{3} a = \frac{2}{3} a^3$$

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

