

$f(1) = 1 - a$   
 $f(3) = 1 - \frac{a}{3}$

$\rightarrow m = \frac{1 - \frac{a}{3} - 1 + a}{3 - 1} = \frac{\frac{2a}{3}}{2} = \frac{a}{3}$

$f'(x) = +\frac{a}{x^2} \rightarrow \frac{a}{x^2} = \frac{a}{3} \rightarrow x^2 = 3 \rightarrow x = \sqrt{3} \checkmark$   
 $x = -\sqrt{3} \times$   
 در بازه داده بوده نیست.

$y = fax - a = -1$   
 $fax = f$   
 $x = \frac{1}{a}$

نقطه در نقطه A برابر ۱ - است.

نیمساز نامیده می شود  $x = -x$

$f(\frac{1}{a}) = -\frac{1}{a} = \frac{2}{a} - \frac{a}{a} + 11a \Rightarrow$

$-1 = 2 - a + 11a^2 \rightarrow 11a^2 = 2 - 1 \rightarrow a^2 = \frac{1}{11} \rightarrow a = \frac{1}{\sqrt{11}} \checkmark$   
 $a = -\frac{1}{\sqrt{11}} \times$

$y = x^3 - 12x^2 + 2 \rightarrow y' = 3x^2 - 24 = 3(x^2 - 4) = 0 \rightarrow x = 2, -2$

x	-2	2
y'	+	-
y	-30	-14

min نسبی

$y = x^3 + ax^2 - 2bx - 4 \rightarrow y' = 3x^2 + 2ax - 2b$   
 $\rightarrow -2b = 0 \rightarrow b = 0$  ,  $12 - 4a = 0 \rightarrow a = 3$

نقطه ۵، ۴، ۳ در این نقاط  $x = -2, 0, 2$  صفر می شود

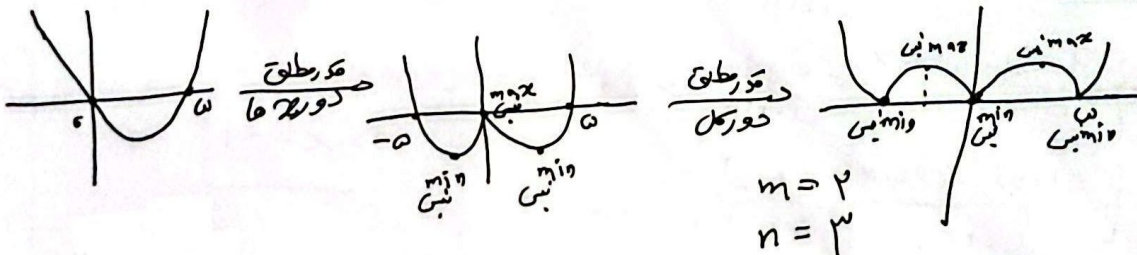
$y = x^3 + 3x^2 - 4$

فاصله نقطه  $= \sqrt{(5-(-2))^2 + (-4-0)^2} = \sqrt{49+16} = 2\sqrt{13}$

0	-2
-4	0

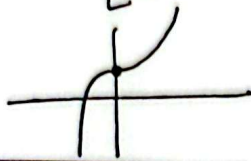
$f(x) = x^2 - 5|x|$

$\frac{n}{m} = \frac{3}{2}$

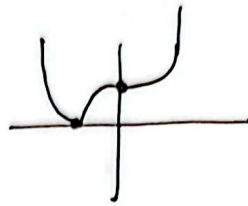


$$y = |x(|x+3|)| = |x|x+3|$$

$$x|x+3| = \begin{cases} x^2+3x & x \geq 0 \\ -x^2+3x & x \leq 0 \end{cases}$$



قدر مطلق دور کردن



$$\frac{59 - \sqrt{3}}{62}$$

$$f(x) = \sqrt[3]{2x} (x-a) \xrightarrow{\text{در بازه قدر منفی}} \sqrt[3]{2x} (a-x) \rightarrow f'(x) = \frac{2(a-x)}{3\sqrt[3]{2x}} - \sqrt[3]{2x} = 0$$

$$a = \frac{a}{3} = 2|a| \quad 2a - 2x - 3x = 0 \quad 2a = 0x \rightarrow x = \frac{2a}{5}$$

$$\begin{matrix} x & 0 & \frac{2a}{5} & a \\ y & 0 & \sqrt[3]{\frac{2a^2}{5}} \left(\frac{3a}{5}\right) & 0 \end{matrix}$$

$$\rightarrow \sqrt[3]{\frac{2a^2}{5}} \left(\frac{3a}{5}\right) = \frac{6a^3}{125}$$

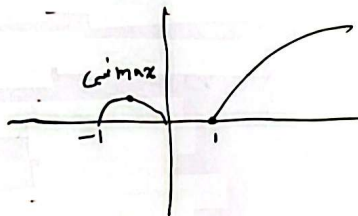
$$\sqrt[3]{\frac{2a^2}{5}} = \frac{2|a|}{5}$$

$$\frac{2a^2}{5} = \frac{2|a|^3}{125} \rightarrow f_a = \frac{2|a|}{5} \times 10$$

$$f_a = \frac{4|a|}{5}$$

$$y = \sqrt{|x|} - x$$

$$\begin{matrix} m = 1 \\ n = 0 \\ k = f \end{matrix}$$



$$\frac{f(x) - 0}{f - 0} = 1$$

بازگ (1, +∞) باید زیر منبسط دامنه تابع باشد  
یعنی مجانب عمود نباید در این بازه باشد

$$\rightarrow y' = \frac{m(m-1)-x}{(x+m-1)^2} < 0 \rightarrow m^2 - m - x = (m-1)(m+1) < 0$$

$$\rightarrow -1 < m < 1 \quad \textcircled{2}$$

$$\textcircled{1}, \textcircled{2} \rightarrow 0 \leq m < 1 \rightarrow m=0, m=1$$

$$Df = \mathbb{R} - \{1\} \rightarrow f(x) = \begin{cases} \frac{x}{1-x^2} & x \geq 0, a \neq 1 \\ \frac{x}{1+x^2} & x < 0 \end{cases}$$

انقض

$$f'(x) = \begin{cases} \frac{(1-x^2) - (x^2)x}{(1-x^2)^2} = \frac{1-x^2}{(1-x^2)^2} & x \geq 0, x \neq 1 \\ \frac{(1+x^2) - (x^2)x}{(1+x^2)^2} = \frac{1-x^2}{(1+x^2)^2} & x < 0 \end{cases}$$

$$\rightarrow x = -1$$

1.