

$$\frac{f(x) - f(1)}{x - 1} = \lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a}$$

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

$$\frac{1 - \frac{a}{x} - 1 + \frac{a}{1}}{x - 1} = \frac{\frac{a}{1} - \frac{a}{x}}{x - 1} = \frac{a \left( \frac{x-1}{x} \right)}{x-1} = \frac{a}{x}$$

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

$\cdot x = \sqrt[3]{1}$  در بازه نیست  $\leftarrow$  در نقطه ای بطل  $\leftarrow$

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$$2ax^2 - 5ax + 11a = x \rightarrow 2ax^2 - 5ax + 11a - x = 0 \rightarrow 2ax^2 - (5a+1)x + 11a = 0$$

$$f(x) = 2ax^2 - 5ax + 11$$

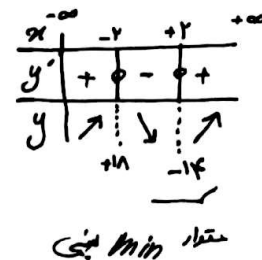
$$g(x) = x$$

$\Rightarrow a = \pm \frac{1}{4} \rightarrow$  اگر  $a = \frac{1}{4}$   $\Rightarrow y = x^2 - 5x + 11 \rightarrow$  نمودار همواره بالای محور  $x$  است  
و بر خیزار تا حدی بر محور  $x$  می خورد

$$a = -\frac{1}{4} \rightarrow$$
 قابل قبول  $\Rightarrow a = \boxed{-\frac{1}{4}}$

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$$y = x^3 - 12x + 2 \rightarrow y' = 3x^2 - 12 \stackrel{y'=0}{=} x^2 = 4 \Rightarrow x = \pm 2$$



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$$y = x^3 + ax^2 - 2bx - 4 \rightarrow y' = 3x^2 + 2ax - 2b \stackrel{x=0}{=} -2b = 0 \Rightarrow b = 0$$

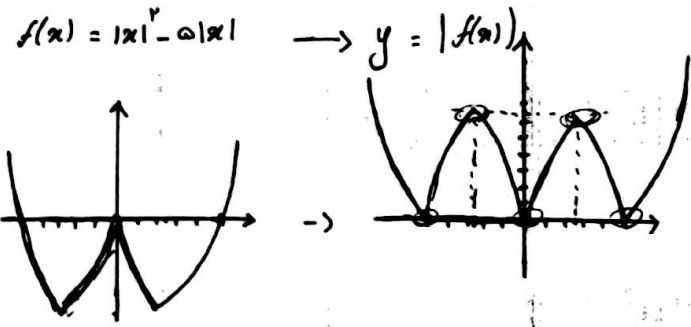
$$\hookrightarrow y = x^3 + 3x^2 - 4 \rightarrow A(0, -4)$$

$$\hookrightarrow B(-2, 0)$$

$$x = -2 \rightarrow 12 - 4a = 0 \Rightarrow a = 3$$

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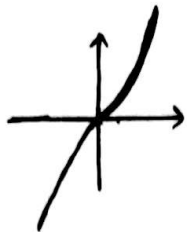
$$\rightarrow AB = \sqrt{(0+2)^2 + (-4-0)^2} = \sqrt{4+16} = \sqrt{20}$$



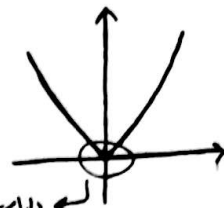
$$m = 2 \quad n = 3 \quad \frac{n}{m} = \frac{3}{2} = 1,5$$

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$$f(x) = \begin{cases} x^r + px & ; x \geq 0 \\ -x^r + px & ; x < 0 \end{cases}$$



$$\rightarrow y = |f(x)|$$



درای یک نقطه بحرانی در  $x=0$ .

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$$f(0) = 0 \quad / \quad f(a) = 0$$

$$f(x) = \sqrt[r]{a^r - x^r} \leftarrow [0, a]$$

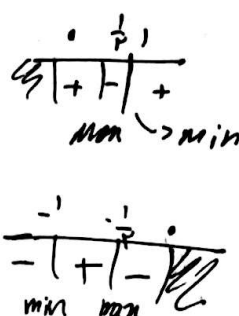
$$f'(x) = \frac{-rx + pa}{r\sqrt[r]{x}} \rightarrow -rx + pa = 0 \Rightarrow x = \frac{pa}{r}$$

$$f\left(\frac{a}{r}\right) = \sqrt[r]{\frac{ra^r}{r}} = \frac{a}{r} = \frac{r}{r} \Rightarrow \frac{ra^r}{r} = \frac{r^r}{ra^r} \Rightarrow a = \frac{r}{r} \sqrt[r]{\frac{r}{r}}$$

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$$f(x) = \sqrt[n]{|x|^{n-1} - n}$$

$$f'(x) = \begin{cases} \frac{r(n-1)}{r\sqrt[r]{n^r-n}} \\ \frac{-r(n-1)}{r\sqrt[r]{-n^r-n}} \end{cases}$$



$n = r = \text{min}$   
 $m = r = \text{max}$   
 $x = 0 = \text{برانی}$

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

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$$y = \frac{m^r + r}{r-1+m} \quad (1, +\infty) \quad \text{زیگی}$$

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

$$m^r - m - r < 0 \quad \frac{-1}{r-1} + m = \{-1, 0, 1\}$$

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$$f(x) = \frac{x}{1-|x/x|} \Rightarrow f(x) = \begin{cases} \frac{x}{1-x} & x > 0 \\ \frac{x}{1+x} & x < 0 \end{cases}$$

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

تابع درای مشتق در  $x=0$  است  
 فقط می‌توانی نیز بنویسی.

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