

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

$$f'(x) = \frac{a}{x^2} \Rightarrow \frac{a}{x^2} = \frac{a}{x} \Rightarrow x = \pm \sqrt{x} \rightarrow \begin{cases} x = -\sqrt{x} \times \\ x = \sqrt{x} \checkmark \end{cases}$$

$$y = 2a x^2 - 5x + 18a \Rightarrow y' = 4ax - 5 = 0 \Rightarrow x = \frac{5}{4a} = \frac{3}{2a}$$

ری.م.باز $x=y$
 ا.م.باز $x \rightarrow$ $\frac{5}{4a} = \frac{3}{2a} \Rightarrow 18a = \frac{9}{2a} \Rightarrow a = \pm \frac{1}{2}$
 چون ناممکن است $\Rightarrow a = -\frac{1}{2}$ ✓

$$y = x^3 - 12x + 2 \Rightarrow y' = 3x^2 - 12 = 0 \Rightarrow x = \pm 2$$

x	-2	2	
y'	$+$	$-$	$+$
	\nearrow	\searrow	\nearrow

$x_{\min} = 2 \Rightarrow y = 1 - 24 + 2 = -11$ ✓

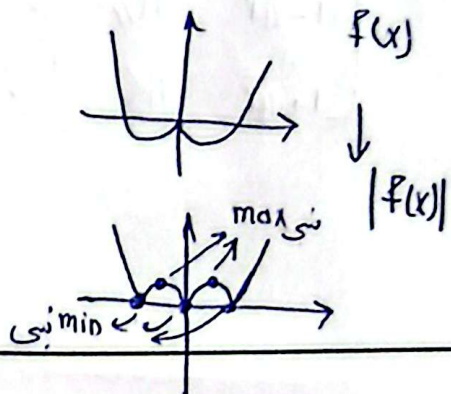
$$y = x^3 + ax^2 - 2bx - c \Rightarrow y' = 3x^2 + 2ax - 2b = 0$$

استقامتی $\rightarrow x=0 \Rightarrow 0 = 3(0)^2 + 2a(0) - 2b \Rightarrow b=0$
 $x=-2 \Rightarrow 0 = 3(-2)^2 + 2a(-2) - 2b \Rightarrow a=3$ ✓

$x=0 \Rightarrow y = -c$
 $x=-2 \Rightarrow y = 0 \Rightarrow \begin{cases} -c \\ 0 \end{cases} \Rightarrow \text{فاصله} = \sqrt{(-c)^2 + (0)^2} = \sqrt{c^2} = c = 2\sqrt{5}$

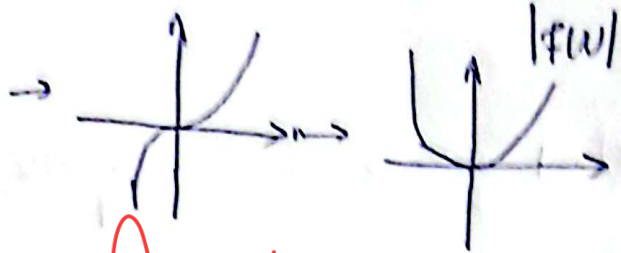
$$f(x) = x^2 - 5|x| \Rightarrow f(x) = \begin{cases} x^2 - 5x & x \geq 0 \\ x^2 + 5x & x < 0 \end{cases}$$

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



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

$u > 0$
 $u < 0$



انعکاسی دارد

$$u < a \Rightarrow f(x) = a^{\frac{1}{p}}(a-u) \Rightarrow f'(x) = \frac{1}{p} a^{\frac{1}{p}-1}(a-u) - a^{\frac{1}{p}}$$

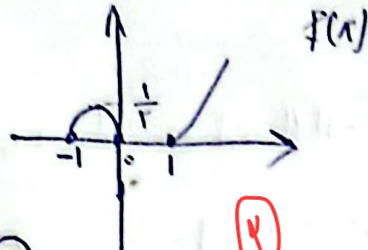
$$\Rightarrow \frac{1}{p}(a-u) = u \Rightarrow 2a - 2u = pu \Rightarrow u = \frac{2a}{p}$$

$$\Rightarrow f\left(\frac{2a}{p}\right) = 1/a \Rightarrow \sqrt[p]{\frac{2a^p}{p^p}} \cdot \left(\frac{2a}{p}\right) = \frac{1}{p} \Rightarrow \sqrt[p]{\frac{2a^p}{p^p}} = \frac{p}{2a}$$

$$\Rightarrow \frac{2a^p}{p^p} = \frac{p^p}{4a^p} \Rightarrow a^p = \frac{p^p}{4} \Rightarrow a = \frac{p}{2}$$

$$f(x) = \begin{cases} \sqrt{x^2 - x} & x > 0 \\ \sqrt{-x^2 - 4} & x < 0 \end{cases}$$

$u > 0$
 $x < 0$



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

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

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

$$-1 < m < 2$$

$$m = 0 \text{ or } 1 \rightarrow \boxed{m < 2}$$

$$f(x) = \begin{cases} \frac{u}{1-u^2} \\ \frac{u}{1+u^2} \end{cases}$$

$u > 0$ (مشتق منفی)
 $u < 0$ (مشتق مثبت)

$$f'(x) = \frac{u^2+1}{(1-u^2)^2}$$

$$f'(x) = \frac{-u^2+1}{(1+u^2)^2}$$

$$D_f = \mathbb{R} - \{1\}$$

$u=1$ و $u=0$ → عریض
مشتق ندارد
عریض
 $u=1$ → عریض
مشتق ندارد

بند نقطه بحرانی

انعکاسی بحرانی دارد. $u=1$ و $u=-1$