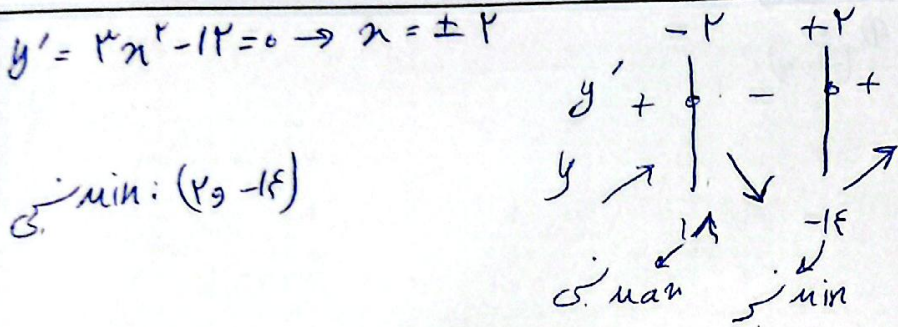


$$\frac{f(x) - f(1)}{x-1} = \frac{1 - a^x + a - 1}{x-1} = \frac{a}{x} \quad f'(x) = \frac{a}{x^2} \quad \frac{a}{x^2} = \frac{a}{x} \rightarrow x = \pm \sqrt{x}$$

$$y_1 = 2ax^2 - 5x + 11 \quad y_1' = 4ax - 5 \quad y_2 = x \quad y_2' = 1 \quad y_1' = y_2' \rightarrow$$

$$4ax - 5 = 1 \rightarrow x = \frac{6}{4a} \quad y_1 = y_2 \rightarrow 2ax^2 - 5x + 11 = x \rightarrow$$

$$\frac{9}{4a^2} - \frac{9}{2a} + 11 = 0 \rightarrow -\frac{1}{4a^2} = -1 \rightarrow a = \pm \frac{1}{2} \rightarrow a = -\frac{1}{2}$$



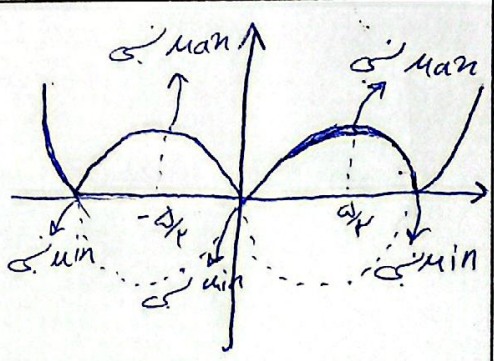
$$y' = 3x^2 + 2ax - 2b = 0 \quad \begin{cases} x=0 & -2b = 0 \rightarrow b=0 \\ x=-2 & 12 - 4a - 2b = 0 \rightarrow a=3 \end{cases}$$

(0, -f)

(-2, 0) $\sqrt{(-2+0)^2 + (-4+0)^2} = 2\sqrt{2}$

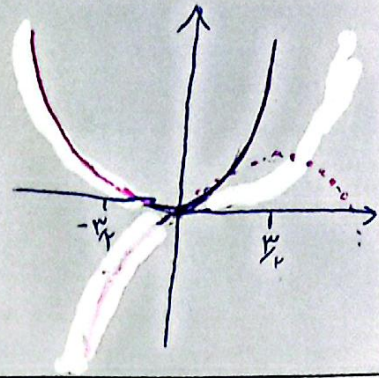
$f(x) = 2x \pm 5 \rightarrow x = \pm 5 \quad m=2 \quad n=3$

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



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

نقطه نقطه بحرانی: نقطه (0,0)



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$$a > 0 \rightarrow f(x) = \sqrt[3]{x^2} (a-x) \rightarrow f'(x) = -\sqrt[3]{x^2} + \frac{2x}{3\sqrt[3]{x^2}} (a-x) = 0$$

$$\rightarrow \frac{2x(a-x)}{3\sqrt[3]{x^2}} = \sqrt[3]{x^2} \rightarrow 2x(a-x) = 3x^2 \xrightarrow{x \neq 0} 2a - 2x = 3x$$

$$x = \frac{2}{5}a$$

$$f\left(\frac{2a}{5}\right) = \sqrt[3]{\frac{4a^2}{25}} \times \frac{3a}{5} = \frac{3}{5} \sqrt[3]{\frac{4a^3}{25}}$$

$$\frac{\epsilon a^3}{\delta^3} = \frac{1}{\lambda} \rightarrow \delta^3 = \frac{\epsilon a^3}{\lambda} \rightarrow \delta = \sqrt[3]{\frac{\epsilon a^3}{\lambda}} \rightarrow \delta = \frac{a}{\sqrt[3]{\lambda}}$$

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$$f'(x) \begin{cases} \frac{2x-1}{2\sqrt{x^2-x}} & Df = (0, 1) \cup (1, \infty) \xrightarrow{\text{نقطه بحرانی}} x = \frac{1}{2}, x=0, x=1 \\ -\frac{2x-1}{2\sqrt{x^2-x}} & Df = [-1, 0) \xrightarrow{\text{نقطه بحرانی}} x = -\frac{1}{2}, x=0, x=1 \end{cases}$$

نقطه بحرانی: $x=0, x=1, x=-\frac{1}{2}, x=\frac{1}{2}$ چون سرودن اینها در جهت اول max می باشد و در جهت دوم min می باشد

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

$K=f \leftarrow x = \pm \frac{1}{2}$ و 0 : نقطه بحرانی $m=1 \leftarrow x = \frac{1}{2}$: max
 $n=0 \leftarrow x = 0$: min

8

$$y' = \frac{m(m-1)-x^2}{(x-1+m)^2} < 0 \quad x=1 \begin{cases} \rightarrow f'(1) = 0 \quad X \\ \rightarrow F'(1) = 0 \quad \checkmark \end{cases}$$

$$(x-1+m)^2 = 0 \xrightarrow{x=1} m=0 \rightarrow m \text{ متغیر}$$

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$$F'(x) \begin{cases} \frac{1+x^2}{(1-x^2)^2} & x > 0 \rightarrow x = \pm 1 \\ \frac{1-x^2}{(1+x^2)^2} & x < 0 \rightarrow x = \pm 1 \end{cases}$$

نقطه بحرانی: $x=1, x=-1$

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