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$f(a) = f(-a)$ $f(x) = x^r - 1 \rightarrow f'(x) = rx$

$f(a) \times f'(-a) = -1$

$ra \times -ra = -1 \rightarrow a = \frac{1}{r}$

$f\left(\frac{1}{r}\right) = -\frac{c}{r}$

$r f\left(\frac{1}{r}\right) = -\frac{c}{r}$

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$f(x) = \frac{a}{rx-1} \rightarrow f'(x) = \frac{-ra}{(rx-1)^2}$ $\frac{4-(-12)}{2 \times 8 - (-16)} = \frac{16}{32} = \frac{1}{2} \rightarrow d: y = 4x - 9$

$\frac{a}{rx-1} = 4x - 9$

$\frac{-ra}{(rx-1)^2} = \frac{-r}{4x-9} \Rightarrow$

$ra \times (4x-9) = (rx-1)^2 \Rightarrow 4ra \times x - 9ra = r^2 x^2 - 2rx + 1 = 0$

$a = 12rx^2 - 4rx + 9$

$a = -12rx^2 + 2rx - 1$

$x = \frac{1}{r}$

$x=1 \rightarrow a=-9 \rightarrow f(x) = \frac{-9}{rx-1} \Rightarrow f(0) = \frac{-9}{-1} = 9$

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

$f(1) = r+b \rightarrow \frac{1+a}{a+1} = r+b \rightarrow b = -1$

$f'(1) = r \rightarrow \frac{1-a^2}{(a+1)^2} = r \rightarrow 1-a^2 = ra^2 + 2a + r \rightarrow ra^2 + 2a + r + 1 = 0$

$a - b = -\frac{1}{r} = -(-1) = \frac{1}{r}$

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$f(x) = \sin x + \frac{\cos x}{r}$ $g(x) = \frac{r \sin x}{r} \rightarrow g(x) = f(x) \xrightarrow{[0, \pi]} x = \frac{\pi}{2}$

$f'(x) = \cos x - \frac{\sin x}{r}$ $f'\left(\frac{\pi}{2}\right) = \frac{\sqrt{2}}{2}$ $f\left(\frac{\pi}{2}\right) = \frac{r\sqrt{2}}{2}$

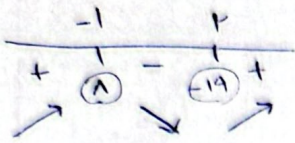
$y = \frac{\sqrt{2}}{2}x + b \xrightarrow{f\left(\frac{\pi}{2}\right) = \frac{r\sqrt{2}}{2}} b = \frac{(4-\pi)\sqrt{2}}{2} \rightarrow y = \frac{\sqrt{2}}{2}x + \frac{(4-\pi)\sqrt{2}}{2}$

$y=0 \rightarrow x = \frac{\pi}{r} - 4$

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$$f(x) = 2x^2 - 12x + 1$$

$$f'(x) = 4x - 12$$



$$\frac{-12 - 1}{2 - (-1)} = \frac{-13}{3} = -4$$

$$f'(x) = -9 \rightarrow 4x^2 - 4x - 12 = -9$$

$$4x^2 - 4x - 3 = 0$$

$$\rightarrow 2x^2 - 2x - 1 = 0$$

$$\Delta = 4 + 8 = 12 > 0$$

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$$f(x) = x^2 + ax^2 + bx - 1 \quad f'(x) = 2x^2 + 2ax + b$$

$$f(-1) = -\varepsilon \rightarrow -1 + a - b - 1 = -\varepsilon \rightarrow a - b = -\varepsilon$$

$$f'(1) = -\varepsilon \rightarrow 2 + 2a + b = -\varepsilon \rightarrow b + 2a = -1 - \varepsilon$$

$$\left. \begin{array}{l} a - b = -\varepsilon \\ b + 2a = -1 - \varepsilon \end{array} \right\} \rightarrow \begin{array}{l} a = \frac{\varepsilon}{3} \\ b = \Delta \end{array}$$

$$\frac{a}{b} = \frac{\varepsilon}{\Delta} \in (0, 1)$$

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$$f(x) = x^2 + ax^2 + bx + c \quad f(0) = \varepsilon \rightarrow c = \varepsilon$$

$$f'(x) = 2x^2 + 2ax + b \quad f'(0) = 0 \rightarrow b = 0 \rightarrow f'(x) = 2x^2 + 2ax$$

$$f(x) = x^2 + ax^2 + \varepsilon$$

$$x(2x + 2a)$$

$$f\left(-\frac{2a}{2}\right) = 0 \quad \frac{-1a^2}{2} + \frac{\varepsilon a^2}{2} + \varepsilon = 0$$

$$\varepsilon a^2 = -1 \rightarrow a^2 = -\frac{1}{\varepsilon}$$

$$a = -\frac{1}{\sqrt{\varepsilon}}$$

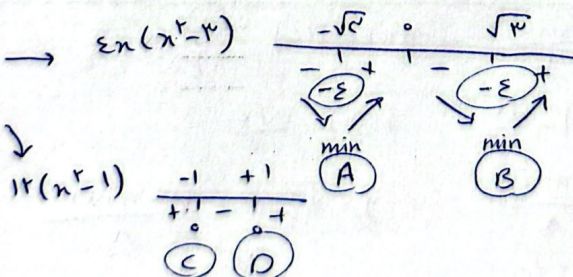
$$\frac{-2a}{2} = 1$$

9

$$f(x) = x^2 - 4x + 8$$

$$f'(x) = 2x - 4 \rightarrow \varepsilon(x - 2)$$

$$f''(x) = 2$$



در بازه حتماً A و B و CD معانی آن
و زانویه ای نیز سازند

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