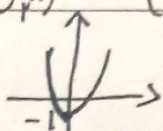


الف) $\begin{cases} y_1^3 = 2x_1^2 - 1 \\ y_2^3 = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \Rightarrow y_1 = y_2$

ب) $\begin{cases} y_1^3 + y_1 = 2x_1^2 - 1 \\ y_2^3 + y_2 = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1 = x_2} y_1^3 + y_1 = y_2^3 + y_2 \Rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2) = 0$

$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2) = 0 \Rightarrow \begin{cases} y_1 - y_2 = 0 \Rightarrow y_1 = y_2 \\ y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1 = 0 \end{cases}$

الف) $y = x^2 - 1$ تابع است



ب) $x = 0 \Rightarrow |y| = 1 \Rightarrow y = \pm 1$ تابع نیست

ج) $\begin{cases} y_1^3 + x_1^3 = 2x_1^2 - 1 \\ y_2^3 + x_2^3 = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \Rightarrow y_1 = y_2$ تابع است

د) $\sqrt[3]{y} = 2 - \sqrt[3]{x} \Rightarrow y = (2 - \sqrt[3]{x})^3$ تابع است

الف) $\frac{\pi}{3} = 60^\circ \quad \tan = \frac{\sin}{\cos} \Rightarrow \tan \frac{\pi}{3} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

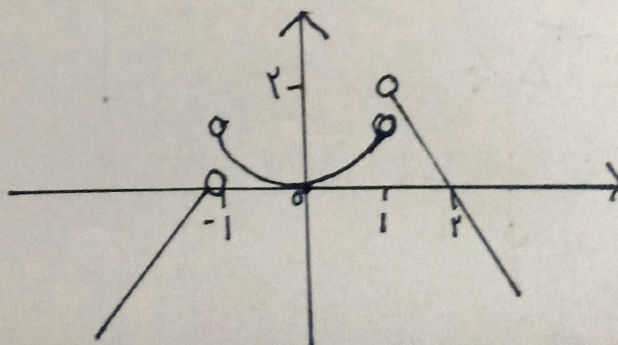
ب) $\frac{5\pi}{6} = 150^\circ \quad \cot = \frac{\cos}{\sin} \Rightarrow \cot \frac{5\pi}{6} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3}$

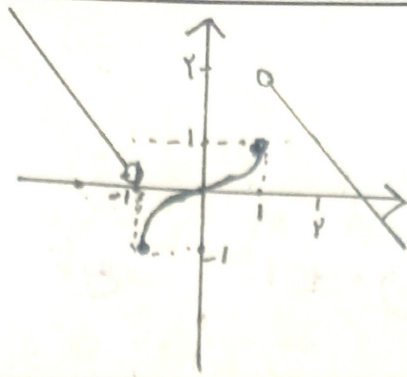
ج) $\tan = \frac{\sin}{\cos} \Rightarrow \tan 230^\circ = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\sqrt{3}$

د) $\cot = \frac{\cos}{\sin} \Rightarrow \cot 180^\circ = \frac{1}{0} \Rightarrow$ تعریف نشده

الف) $a = \frac{\pi}{6} \quad a = 5 \frac{\pi}{6}$

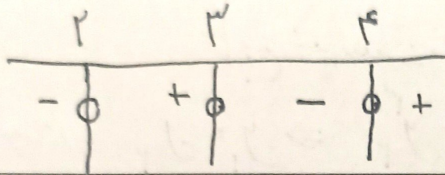
ب) $a = \frac{\pi}{4} \quad a = 3 \frac{\pi}{4}$



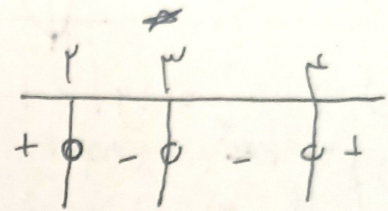


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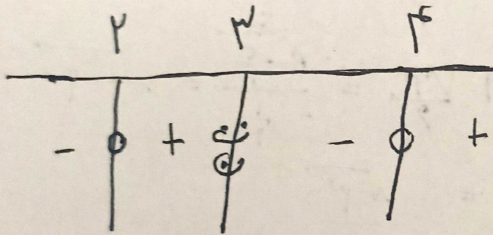


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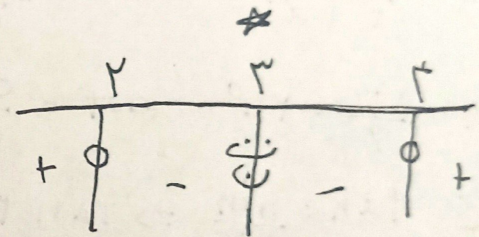


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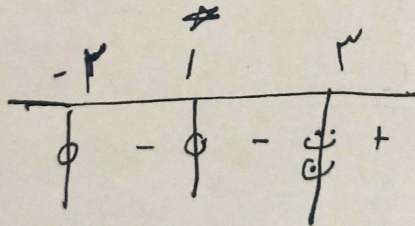
$$y = \frac{x^3 - 3x^2 + 2}{x^3 + x - 2}$$

$$= \frac{x^2(x-3) + 2}{x^2(x+1) - 2}$$

$$= \frac{x^2(x-3) + 2}{x^2(x+1) - 2}$$

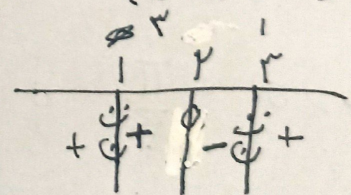
$$= \frac{x^2(x-3) + 2}{x^2(x+1) - 2}$$

$$y = \frac{(x-1)(x+2)(x-1)}{x-3}$$



ب

$$y = \frac{(x-1)(x-2)}{(x-3)(x-1)}$$

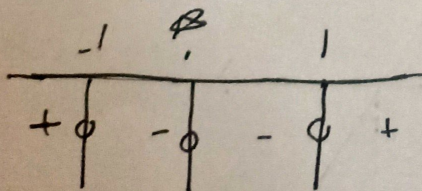


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$$y = \frac{x^2(x-1)}{x^2+x+3}$$

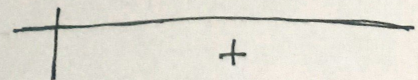
$$\Delta < 0$$



ب

$$y = \frac{x^2+3x+3}{x^2+x+3}$$

$$\Delta < 0$$



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