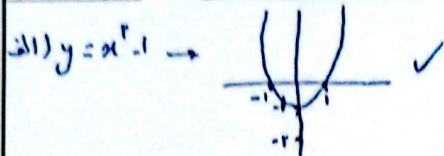


الف) $\left. \begin{aligned} y_1^3 &= 2x_1^2 - 1 \\ y_2^3 &= 2x_2^2 - 1 \end{aligned} \right\} \xrightarrow{x_1=x_2} 2x_1^2 - 1 = 2x_2^2 - 1 \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2$ چون توان فرد است، می توان گفت در مد فرضیه $y_1 = y_2$ می توان به نظر گرفت.

ب) $\left. \begin{aligned} y_1^3 + y_2^3 &= 2x_1^2 + 2x_2^2 - 2 \\ y_1^3 + y_2^3 &= 2x_1^2 + 2x_2^2 - 2 \end{aligned} \right\} \xrightarrow{x_1=x_2} y_1^3 + y_2^3 = y_1^3 + y_2^3 \Rightarrow y_1^3 + y_2^3 = 2(y_1^2 + y_2^2 + y_1 + y_2 + 1) \Rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1) = 0$
 چون $y_1 = y_2$ می توانیم بنویسیم: $y_1^3 + y_2^3 = 2(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1)$
 $\Rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1) = 0 \Rightarrow \begin{cases} y_1 = y_2 \rightarrow \checkmark \\ y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1 = 0 \end{cases}$
 در این حالت تابع است. $\Delta < 0 \rightarrow$ رابطه خطی.



ب) $|y| + xy = x^2 + 1 \Rightarrow |y| = 1 \Rightarrow y = \pm 1$

ج) $\left. \begin{aligned} y_1^3 &= -x_1^3 + 2x_1 - 1 \\ y_2^3 &= -x_2^3 + 2x_2 - 1 \end{aligned} \right\} \xrightarrow{x_1=x_2} y_1^3 = y_2^3 \Rightarrow y_1 = y_2$ چون توان فرد است، می توانیم بنویسیم: $y_1 = y_2$
 د) $\left. \begin{aligned} \sqrt[3]{y_1^3} &= \sqrt[3]{-x_1^3 + 2x_1 - 1} \\ \sqrt[3]{y_2^3} &= \sqrt[3]{-x_2^3 + 2x_2 - 1} \end{aligned} \right\} \xrightarrow{x_1=x_2} \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2$

الف) $\tan \frac{\pi}{3} = \frac{\sin \frac{\pi}{3}}{\cos \frac{\pi}{3}} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

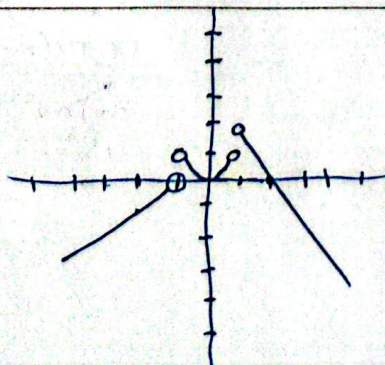
ب) $\cot \frac{\sqrt{3}\pi}{6} = \frac{\cos \frac{\sqrt{3}\pi}{6}}{\sin \frac{\sqrt{3}\pi}{6}} = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\sqrt{3}$

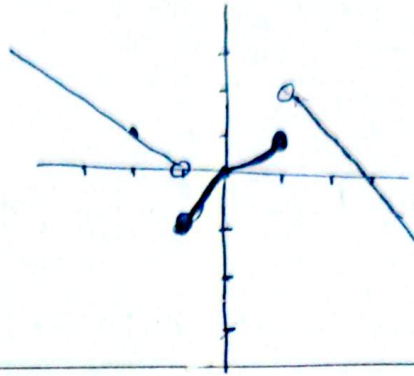
ج) $\tan 330^\circ = \frac{\sin 330^\circ}{\cos 330^\circ} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$

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

الف) $\sin \alpha = \frac{1}{3} \Rightarrow \alpha = \frac{\pi}{6}, \frac{5\pi}{6}$

ب) $\cos \alpha = \frac{\sqrt{2}}{2} \Rightarrow \alpha = \frac{\pi}{4}, \frac{7\pi}{4}$





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الف) $\rightarrow 2, 3, 4$ $\frac{2 \quad 3 \quad 4}{- \phi + \phi - \phi +}$

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ب) $\rightarrow 2, 3, 4, 3$ $\frac{2 \quad 3 \quad 4}{+ \phi - \phi - \phi +}$

الف) $2, 4, 3$ $\frac{2 \quad 3 \quad 4}{- \phi + \phi - \phi +}$

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ب) $2, 3, 3, 4$ $\frac{2 \quad 3 \quad 4}{+ \phi - \phi - \phi +}$

الف) $\frac{(x+2)(x-1)(x-1)}{x^3 - 3x^2 + 2x}$ $\rightarrow 2, 1, 3$

$$\begin{array}{r} x^3 - 3x^2 + 2x \overline{) x^3 - 3x^2 + 2x} \\ \underline{x^3 - 3x^2 + 2x} \\ 0 \end{array}$$

ب) $\frac{(x-2)(x-1)}{(x-3)(x-1)}$ $\rightarrow 1, 2, 3$

$$\frac{1}{x-3} + \frac{2}{x-1} + \frac{3}{x-1}$$

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الف) $\frac{x^2(x^2-1)}{x^2(x^2-1)}$ $\rightarrow 1, 0, 0$

$$\frac{1}{x^2} - \frac{1}{x^2}$$

ب) $\frac{x^2(x^2-1)}{x^2(x^2-1)}$ $\rightarrow 1, 0, 0$

$$\frac{1}{x^2} - \frac{1}{x^2}$$

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