

الف) if $(x_1, y_1) \in f$
if $(x_2, y_2) \in f$

$$y_1^3 = 2x_1^2 - 1 \quad y_2^3 = 2x_2^2 - 1 \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2 \checkmark$$

ب) $y_1^3 + y_1 = 3x_1^2 - 1$
 $y_2^3 + y_2 = 3x_2^2 - 1$

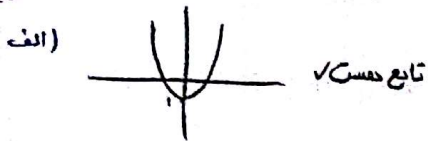
$$\rightarrow y_1^3 + y_1 = y_2^3 + y_2 \rightarrow y_1^3 - y_2^3 + y_1 - y_2 = 0$$

همیشه مثبت
↑

$$\rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2) = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$$

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$$\rightarrow y_1 = y_2 \checkmark$$



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

ج) if $(x_1, y_1) \in f$
if $(x_2, y_2) \in f$

د) $\sqrt[3]{y_1} + \sqrt[3]{x_1} = 2$
 $\sqrt[3]{y_2} + \sqrt[3]{x_2} = 2$

تابع هست ✓

$$y_1^3 + x_1^3 = 2x_1 - 1$$

$$y_2^3 + x_2^3 = 2x_2 - 1$$

$$\rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2 \checkmark$$

تابع هست ✓

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

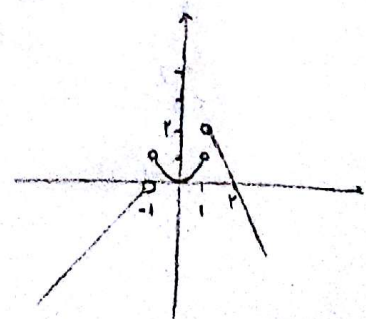
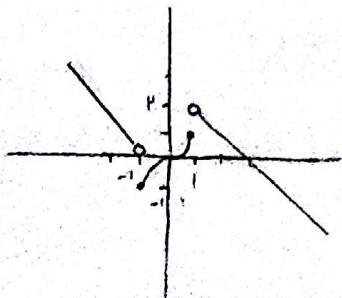
ب) $\frac{\cos}{\sin} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \sqrt{3}$

ج) $\frac{\sin}{\cos} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$

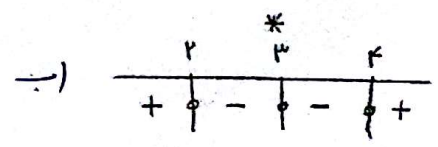
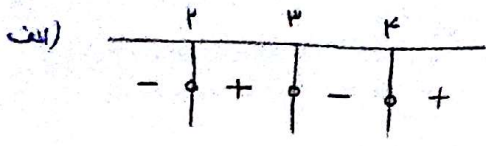
د) $\frac{\cos}{\sin} = \frac{-1}{0}$ تعریف نشده

الف) $\alpha = \frac{\pi}{4}$ و $\frac{5\pi}{4}$

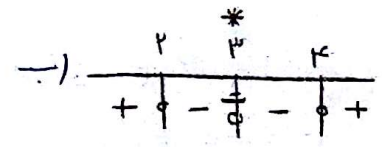
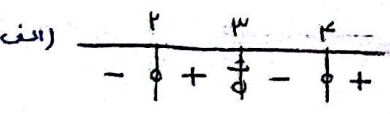
ب) $\frac{\pi}{4}$ و $\frac{7\pi}{4}$



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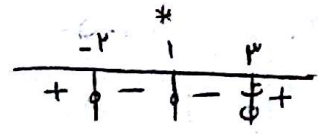
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الف) $x^3 - 3x^2 + 2x \rightarrow a+b+c=0 \rightarrow (x-1)$ بخش پذیر
 $\xrightarrow{1} (x-1)(x^2+x-2) \rightarrow 1, 2$
 $\xrightarrow{2} x-2$

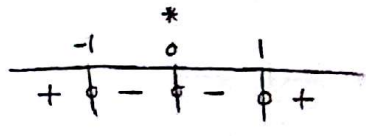
$$\begin{array}{r|l} x^3 - 3x^2 + 2x & x-1 \\ -x^3 + x^2 & \\ \hline +x^2 - 3x + 2 & \\ -x^2 + x & \\ \hline -2x + 2 & \\ +2x - 2 & \\ \hline 0 & \end{array}$$



صفت ب پاسخ سوال

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الف) $x^4 - x^2 - x^2(x^2-1) \rightarrow x=0, \pm 1$
 $\rightarrow \Delta = b^2 - 4ac = 1 - 4 < 0$ خروجی ریشه ندارد



صورت $\Delta = 9 - 16 < 0$ صورت و مخرج ریشه ندارند
 $\rightarrow \Delta = 4 - 12 < 0$ هسیه صفت

9. ب) $x^2 - 3x + 2 \rightarrow a+b+c=0 \rightarrow x=1, 2$
 $x^2 - 4x + 3 \rightarrow a+b+c=0 \rightarrow x=1, 3$

