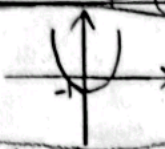


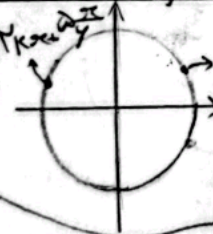
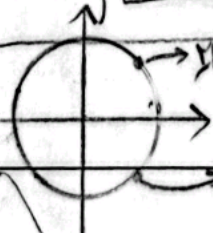
تابع $y = y_1 = y_2$ هست $\Rightarrow \sqrt[3]{x^3 - 1} = \sqrt[3]{x_1^3 - 1} \Rightarrow x^3 - 1 = x_1^3 - 1 \Rightarrow x^3 = x_1^3 \Rightarrow x = x_1$ (الف)

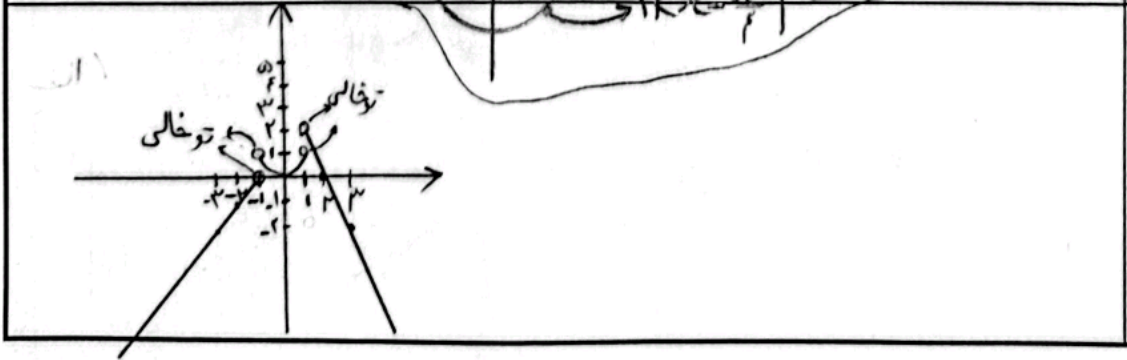
ب) $x^3 + y = x^3 - 1 \Rightarrow y = -1$ $\Rightarrow (y_1)^3 + y_1 = (y_2)^3 + y_2 \Rightarrow (y_1)^3 - (y_2)^3 + y_1 - y_2 = 0$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2) = 0$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$
 $\Delta = (y_1)^2 - 4(y_2^2 + 1) = -3(y_2)^2 - 4$ منفی

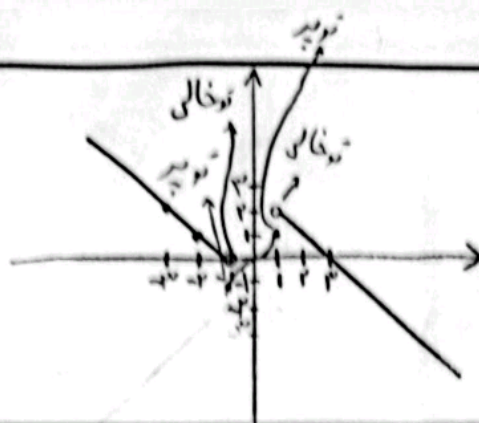
تابع $y = x^2 - 1$ (الف)  تابع هست $y = \pm(x^2 - x + 1)$ نیست

ج) $y^3 + x^3 = x^3 - 1 \Rightarrow y^3 = -1 \Rightarrow y = -1$ تابع هست
 د) $\sqrt[3]{y} + \sqrt[3]{x} = 2 \Rightarrow \sqrt[3]{y} = 2 - \sqrt[3]{x} \Rightarrow y = (2 - \sqrt[3]{x})^3$ تابع هست

الف) $\tan(\frac{\pi}{3}) \rightarrow \frac{\sin 60^\circ}{\cos 60^\circ} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$
 ب) $\cot(\frac{\sqrt{2}\pi}{2}) \rightarrow \frac{\cos 45^\circ}{\sin 45^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$
 ج) $\tan(\frac{\pi}{4}) \rightarrow \frac{\sin 45^\circ}{\cos 45^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$
 د) $\cot(180^\circ) \rightarrow \frac{\cos 180^\circ}{\sin 180^\circ} = \frac{-1}{0}$ تعریف نشده

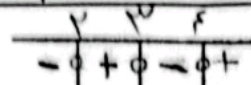
$\sin \alpha = \frac{1}{2}$  $\{2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$
 ب) $\cos \alpha = \frac{\sqrt{2}}{2}$  $\{2k\pi + \frac{\pi}{4}, 2k\pi - \frac{\pi}{4}\}$





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الف) $y = (x-1)(x-3)(x-4)$

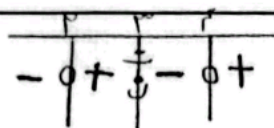


ب) $y = (x-2)(x-3)(x-4)$

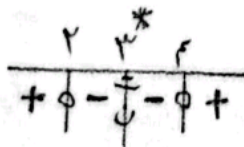


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الف) $y = \frac{(x-1)(x-4)}{x-3}$



ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$

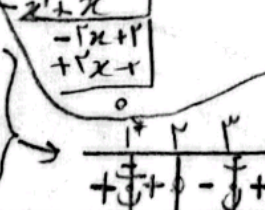


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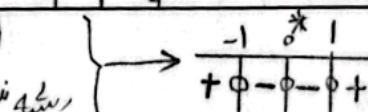
الف) $y = \frac{x^3 - 3x^2 + 2}{x-3}$

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

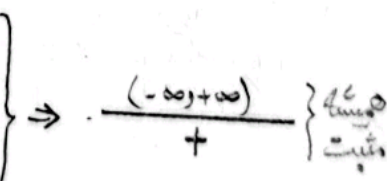
ب) $y = \frac{x^3 - 3x^2 + 2}{x^2 - 6x + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)}$



الف) $\frac{x^2 - x^2}{x^2 + x + 1} \rightarrow \Delta = b^2 - 4ac = 1 - 4 = -3$



ب) $\frac{x^2 + 3x + 4}{x^2 + 2x + 3} \rightarrow \Delta = b^2 - 4ac = 9 - 12 = -3$



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