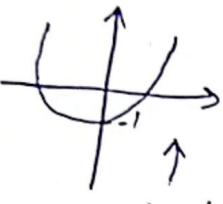
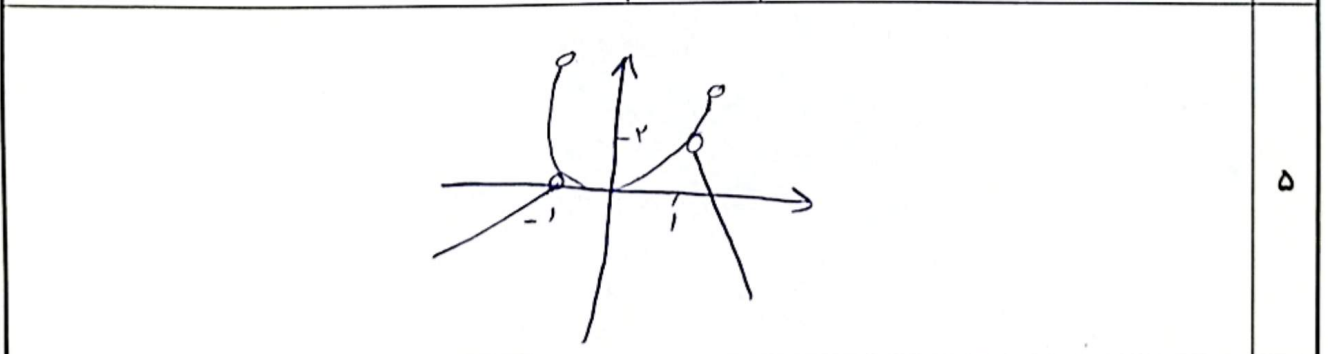


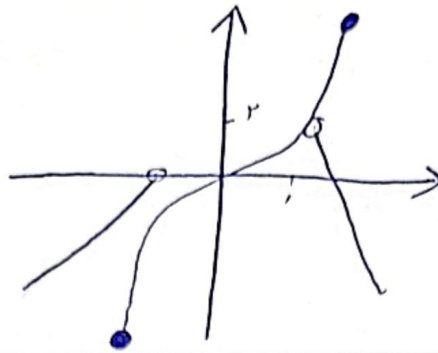
الف) $y''' = 2x^2 - 1 \rightarrow \begin{cases} y_1' = 2x_1^2 - 1, \\ y_2' = 2x_2^2 - 1, \end{cases} \xrightarrow{x_1 = x_2} y_1' = y_2'$
 $y'' + y = 0$ تابع است
 ب) $y''' + y = 2x^2 - 1 \rightarrow \begin{cases} y_1' + y_1 = 2x_1^2 - 1, \\ y_2' + y_2 = 2x_2^2 - 1, \end{cases} \xrightarrow{x_1 = x_2} y_1' - y_2' + y_1 - y_2 = 0$

الف) $y = x^2 - 1$  تابع است
 ب) $|y| + x = x^2 + 1$
 $x=0 \rightarrow |y| + 0 = 1 \rightarrow |y| = 1 \rightarrow y = 1 \text{ or } y = -1$
 $y = 1$ تابع نیست
 $y = -1$ تابع است
 ج) $y''' + x^3 = 2x - 1$
 $x=0 \rightarrow y''' + 0 = -1 \rightarrow y''' = -1$
 $y'' = -x$
 $y' = -\frac{x^2}{2} + C$
 $y = -\frac{x^3}{6} + Cx + D$
 د) $\sqrt[3]{y} + \sqrt[3]{x} = 2$
 $\sqrt[3]{y} = 2 - \sqrt[3]{x}$
 $y = (2 - \sqrt[3]{x})^3$

الف) $\tan \frac{\pi}{3}$
 $\frac{\sin}{\cos} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$
 ب) $\cot \frac{\sqrt{3}\pi}{6}$
 $\frac{\cos}{\sin} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3}$
 ج) $\tan 330^\circ$
 $\frac{\sin}{\cos} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$
 د) $\cot 110^\circ$
 $\frac{\cos}{\sin} = \frac{-1}{0}$
 تعریف نشده

الف) $\sin \alpha = \frac{1}{\sqrt{2}} \Rightarrow \alpha = \frac{\pi}{4}, \frac{3\pi}{4}$
 ب) $\cos \alpha = \frac{\sqrt{2}}{2} \Rightarrow \alpha = \frac{\pi}{4}, \frac{7\pi}{4}$





٦

الف) $(x-2)(x-3)(x-4)$

$$\begin{array}{c|c|c|c} 2 & 3 & 4 \\ \hline - & + & - & + \end{array}$$

ب) $(x-2)(x-3)^2(x-4)$

$$\begin{array}{c|c|c|c} 2 & 3^* & 4 \\ \hline + & - & - & + \end{array}$$

٧

الف) $y = \frac{(x-2)(x-4)}{x-3}$

~~$$\begin{array}{c|c|c|c} 2 & 3 & 4 \\ \hline - & + & - & + \end{array}$$~~

$$\begin{array}{c|c|c|c} 2 & 3 & 4 \\ \hline - & + & - & + \end{array}$$

٨

ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$

$$\begin{array}{c|c|c|c} 2 & 3^* & 4 \\ \hline + & - & - & + \end{array}$$

الف) $\frac{x^3 - 3x^2 + 2x}{x-3} \geq 0 \quad x-3 \neq 0$

$$\begin{array}{c|c|c|c} -2 & 1^* & 3 \\ \hline + & - & - & + \end{array}$$

٩

ب) $\frac{x^3 - 3x^2 + 2x}{x^2 - 4x + 3} \geq 0 \quad x^2 - 4x + 3 \neq 0$

$$\begin{array}{c|c|c|c} 1^* & 2 & 3 \\ \hline + & - & - & + \end{array}$$

الف) $\frac{x^4 - x^2}{x^2 + 2x + 3}$

$$\begin{array}{c|c|c|c} -1 & 0^* & 1 \\ \hline + & - & - & + \end{array}$$

ب) $\frac{x^2 + 3x + 4}{x^2 + 2x + 3}$

این عبارت ریشه حقیقی ندارد ←

١٠