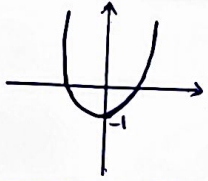
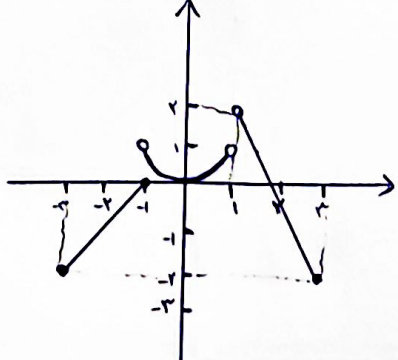
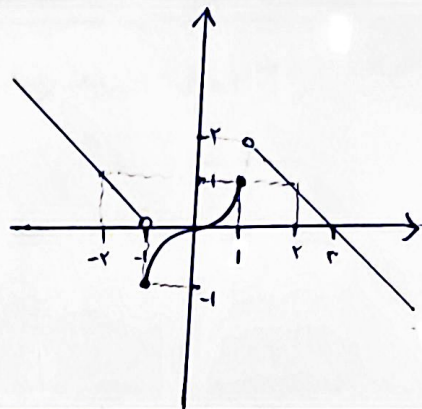


الف) $y^3 = 2x^2 - 1$ $\begin{cases} y_1^3 = 2x_1^2 - 1 \\ y_2^3 = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1=x_2} y_1^3 = y_2^3$ $\Rightarrow y_1 = y_2$ تابع است	ب) $y^3 + y = 3x^2 - 1$ $\begin{cases} y_1^3 + y_1 = 3x_1^2 - 1 \\ y_2^3 + y_2 = 3x_2^2 - 1 \end{cases} \xrightarrow{x_1=x_2} y_1^3 + y_1 = y_2^3 + y_2$ $\Rightarrow y_1^3 - y_2^3 + y_1 - y_2 = 0 \Rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) + (y_1 - y_2) = 0$ $\Rightarrow y_1 - y_2 = 0 \Rightarrow y_1 = y_2$ تابع است	الف) $y = x^2 - 1$  تابع است	ج) $y^4 + x^3 = 2x - 1$ تابع است $\begin{cases} y_1^4 = 2x_1 - x_1^3 - 1 \\ y_2^4 = 2x_2 - x_2^3 - 1 \end{cases} \xrightarrow{x_1=x_2} y_1^4 = y_2^4 \Rightarrow y_1 = y_2$	ب) $y + xy = x^2 + 1 \xrightarrow{x=0} y = 1$ $\Rightarrow y = 1, -1$ تابع نیست	د) $\sqrt[3]{y} + \sqrt{x} = 2$ تابع است $\begin{cases} \sqrt[3]{y_1} = 2 - \sqrt{x_1} \\ \sqrt[3]{y_2} = 2 - \sqrt{x_2} \end{cases} \xrightarrow{x_1=x_2} \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2$	الف) $\tan \frac{\pi}{6}$ $\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$	ج) $\tan 330^\circ$ $\frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{-1}{\sqrt{3}} = \frac{-\sqrt{3}}{3}$	ب) $\cot \frac{7\pi}{6}$ $\frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \sqrt{3}$	د) $\cot 110^\circ$ $\frac{-1}{0} \rightarrow$ <u>معرّف نشده</u>	الف) $\sin a = \frac{1}{4}$ $\nearrow 30^\circ, 150^\circ \Rightarrow \frac{\pi}{6}, \frac{5\pi}{6}$ 	ب) $\cos a = \frac{\sqrt{3}}{4}$ $\nwarrow 30^\circ, 330^\circ \Rightarrow \frac{\pi}{6}, \frac{11\pi}{6}$ 	الف) $f(x) = \begin{cases} -2x+5 & \rightarrow x > 1 \\ x^2 & \rightarrow -1 < x < 1 \\ x+1 & \rightarrow x < -1 \end{cases}$ 
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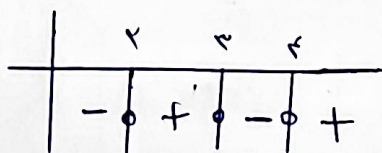
$$f(x) = \begin{cases} -x+2 & \rightarrow x > 1 \\ x^2 & \rightarrow -1 \leq x \leq 1 \\ -x-1 & \rightarrow x < -1 \end{cases}$$



6

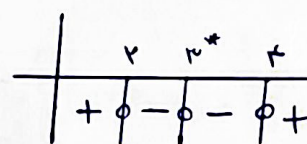
الف) $y = (x-2)(x-3)(x-4)$

$\downarrow$ $\downarrow$ $\downarrow$
 2 3 4



ب) $y = (x-2)(x-3)^2(x-4)$

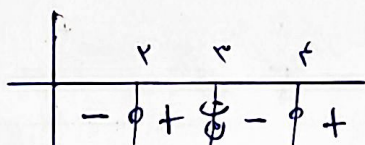
$\downarrow$ $\downarrow$ $\downarrow$
 2 3 4



✓

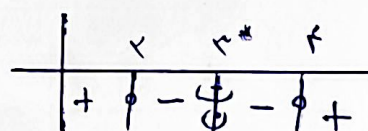
الف) $y = \frac{(x-2)(x-4)}{x-3} \rightarrow 2, 4$

$\downarrow$
 3



ب) $y = \frac{(x-2)(x-4)}{(x-3)^2} \rightarrow 2, 4$

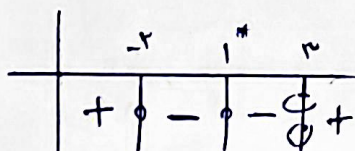
$\downarrow$
 3



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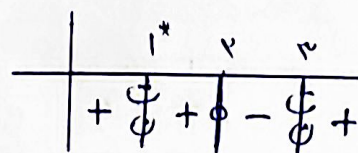
الف) $y = \frac{x^2-5x+2}{x-4} \rightarrow (x-1)(x+2)(x-1)$

$\downarrow$ $\downarrow$ $\downarrow$
 1 -2 1



ب) $\frac{x^2-5x+2}{x^2-4x+4} \rightarrow (x-1)(x-2) \rightarrow 1, 2$

$\downarrow$ $\downarrow$
 1 2

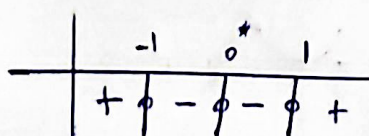


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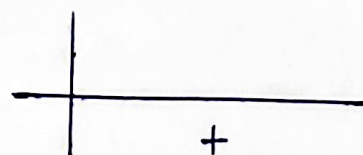
الف) $\frac{x^2-x^2}{x^2+x+2} \rightarrow x^2(x-1)(x+1)$

$\downarrow$ $\downarrow$
 1 -1

کج هوان مثبت است
چون Δ منفی است



ب) $\frac{x^2+3x+2}{x^2+2x+3} \rightarrow$ Δ فرد منفی است
پس ۲ عبارت هوانه
مثبت هستند



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