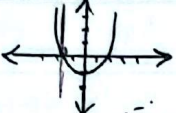
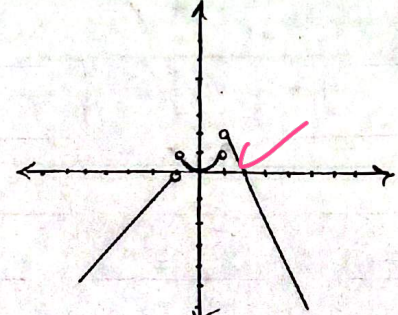
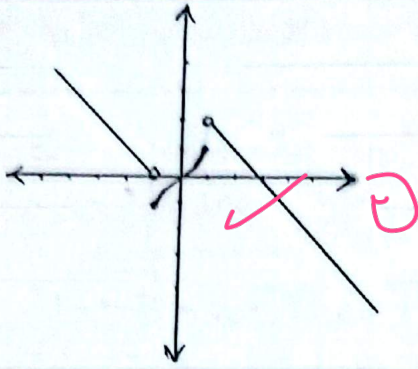
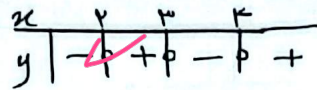


الف) $y^3 = 2x^2 - 1 \rightarrow \begin{cases} y_1^3 = 2x_1^2 - 1 \\ y_2^3 = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1=x_2} y_1^3 = y_2^3 \rightarrow y_1 = y_2$ تابع است ب) $y^3 + y = 3x^2 - 1 \rightarrow \begin{cases} y_1^3 + y_1 = 3x_1^2 - 1 \\ y_2^3 + y_2 = 3x_2^2 - 1 \end{cases} \xrightarrow{x_1=x_2} y_1^3 + y_1 = y_2^3 + y_2 \rightarrow y_1^3 + y_1 - y_2^3 - y_2 = 0$ $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2) = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0 \rightarrow y_1 = y_2$ $y_1^2 + y_1 y_2 + y_2^2 + 1 = 0 \rightarrow y_2 = -y_1 \pm \sqrt{y_1^2 - 4(y_1^2 + 1)}/2 \rightarrow y_2 = -y_1 \pm \sqrt{-3y_1^2 - 4}/2$ تابع نیست	۱
الف) $y = x^2 - 1 \rightarrow$  تابع است. ب) $y + xy = x^2 + 1 \xrightarrow{x=0} y = 1 \rightarrow y = \pm 1$ تابع نیست. ج) $y^3 + x^3 = 2x - 1 \xrightarrow{x_1=x_2} \begin{cases} y_1^3 + x_1^3 = 2x_1 - 1 \\ y_2^3 + x_2^3 = 2x_2 - 1 \end{cases} \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$ تابع است. د) $\sqrt[3]{y} + \sqrt{x} = 2 \xrightarrow{x_1=x_2} \begin{cases} \sqrt[3]{y_1} + \sqrt{x_1} = 2 \\ \sqrt[3]{y_2} + \sqrt{x_2} = 2 \end{cases} \rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2$ تابع است.	۲
الف) $\tan 15^\circ = \sin 15^\circ / \cos 15^\circ = \frac{\sqrt{3}-1}{2} = \frac{\sqrt{3}}{2}$ ب) $\cot 75^\circ = \cos 75^\circ / \sin 75^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ ج) $\tan 330^\circ = \sin 330^\circ / \cos 330^\circ = -\frac{1}{2} / \frac{\sqrt{3}}{2} = -\frac{1}{\sqrt{3}}$ د) $\cot 150^\circ = \cos 150^\circ / \sin 150^\circ = -\frac{1}{2} / \frac{1}{2} = -1$ <u>کوین نشانه!</u>	۳
الف) $\sin \alpha = \frac{1}{4} \quad \alpha = \pi/4, \alpha = 5\pi/4$ ب) $\cos \alpha = \frac{\sqrt{2}}{4} \quad \alpha = \pi/4, \alpha = 7\pi/4$	۴
 <u>د</u>	۵

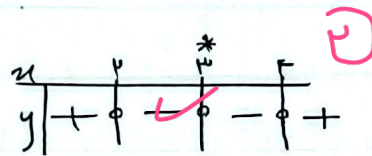


6

الف) $y = (x-2)(x-3)(x-4)$

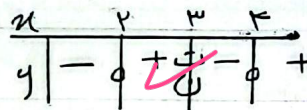


ب) $y = (x-2)(x-3)(x-3)(x-4)$

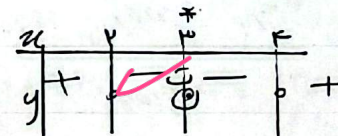


7

الف) $y = (x-2)(x-4)/(x-3)$

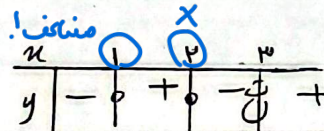


ب) $y = (x-2)(x-4)/(x-3)^2$

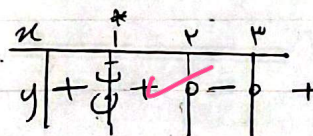


8

الف) $y = x^3 - 3x^2 + 2x / x^3$
تقریب غلط است!

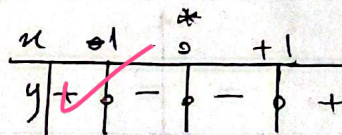


ب) $y = x^3 - 3x^2 + 2x / x^2 - 5x + 3$



9

الف) $y = x^3 - x^2 / x^2 + x + 2$
به ریشه تارار (دو ضلع)



ب) $y = x^2 + 3x + 4 / x^2 + 2x + 3$
ریشه تارار
عبارت همواره مثبت است

10

الف - ۹ $y = \frac{n^3 - 3n + 2}{n - 3} = \frac{(n-1)(n^2 + n - 2)}{n - 3} = \frac{(n-1)(n+2)(n-1)}{n-3}$

مجموعه این صفات برای $n-1$ منفی پذیر است!

Sign chart:

Interval	Sign
$x < -2$	+
$-2 < x < 1$	-
$1 < x < 3$	-
$x > 3$	+