

الف) $y_1^3 = 2x_1^2 - 1$ $x_1 = x_2$ $y_1^3 = y_2^3 \rightarrow y_1 = y_2$
 $y_2^3 = 2x_2^2 - 1$

تابع هست

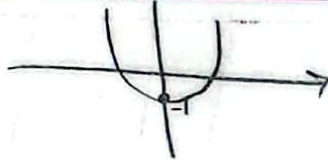
۱۹.۵

①

ب) $y_1^3 + y_1 = 3x_1^2 + 1$ $x_1 = x_2$ $y_1^3 + y_1 = y_2^3 + y_2 \rightarrow y_1^3 - y_2^3 + y_1 - y_2 = 0$
 $y_2^3 + y_2 = 3x_2^2 + 1$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2) = 0$
 $\leftarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$
 $\Delta < 0 \leftarrow (y_1^2 + y_1 y_2 + y_2^2 + 1)$
 عدد منفی در پرانتز

✓ ۲۰

الف) $y = x^2 - 1$



تابع هست

②

ب) if $x = 0 \rightarrow |y| = 1 \rightarrow y = \pm 1$

تابع نیست

ج) $y^3 = -x^3 + 2x - 1 \rightarrow y = \sqrt[3]{-x^3 + 2x - 1}$

باید بدیسی به ازای یک یه یه تابع

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

۱۱.۵

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

ب) $\cot \frac{\sqrt{3}\pi}{4} \rightarrow \frac{\cos}{\sin} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = +\sqrt{3}$

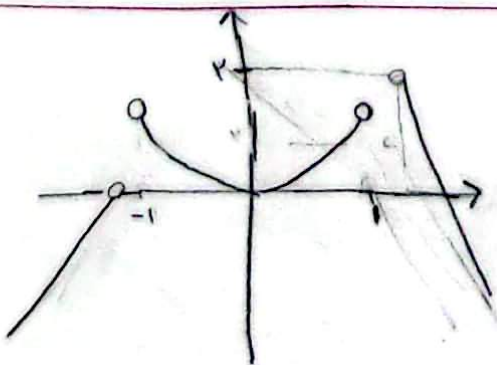
ج) $\tan 330^\circ \rightarrow \frac{\sin}{\cos} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}} \sim -\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

✓ ۲۱

د) $\cot 180^\circ \rightarrow \frac{\cos}{\sin} = \frac{-1}{0}$ تعریف نشده

الف) $\sin a = \frac{1}{2} \rightarrow a = \{30^\circ, 150^\circ\} \rightarrow a = \{2k\pi + \frac{\pi}{6}\}$

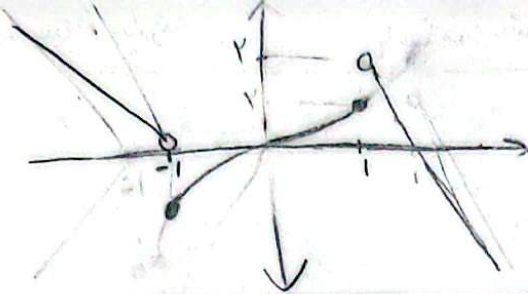
ب) $\cos a = \frac{\sqrt{2}}{2} \rightarrow a = \{45^\circ, 315^\circ\} \rightarrow a = \{2k\pi + \frac{\pi}{4}, 2k\pi + \frac{7\pi}{4}\}$



$f(x) = \begin{cases} -2x + 4 & x > 1 \\ x^2 & -1 < x < 1 \\ x + 1 & x < -1 \end{cases}$

✓ ۲۲

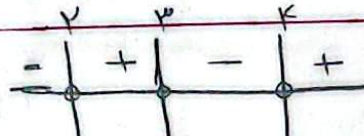
⑤



$$f(x) = \begin{cases} -x+1 & x > 1 \\ x^2 & -1 \leq x \leq 1 \\ -x-1 & x < -1 \end{cases}$$

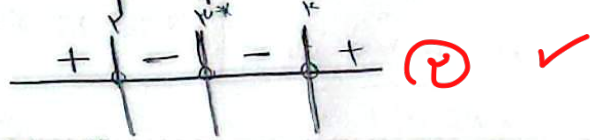
② ✓

الف) $y = \underbrace{(x-2)}_2 \underbrace{(x-3)}_3 \underbrace{(x-4)}_4$



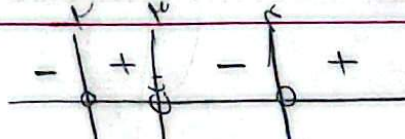
④

ب) $y = \underbrace{(x-2)}_2 \underbrace{(x-3)^2}_3 \underbrace{(x-4)}_4$



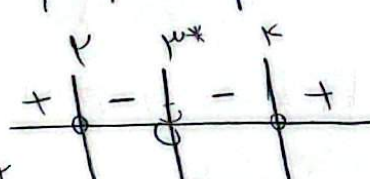
② ✓

الف) $y = \frac{\underbrace{(x-2)}_2 \underbrace{(x-4)}_4}{\underbrace{(x-3)}_3}$



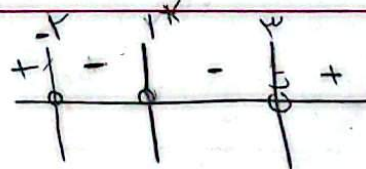
⑤

ب) $y = \frac{\underbrace{(x-2)}_2 \underbrace{(x-4)}_4}{\underbrace{(x-3)^2}_3}$



② ✓

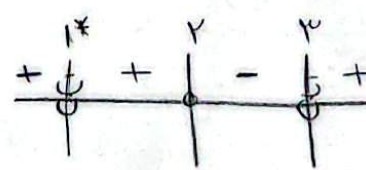
الف) $y = \frac{x^2 - 3x + 2}{x^2 - 5x + 6} = \frac{(x-1)(x-2)}{(x-2)(x-3)}$



$$\begin{array}{r} x^2 - 3x + 2 \quad | \quad x-1 \\ -x^2 + x^2 \\ +x^2 - 3x + 2 \\ -x^2 + 3x - 2 \\ -x^2 + 3x - 2 \\ +x^2 - 5x + 6 \\ -x^2 + 5x - 6 \\ 0 \end{array}$$

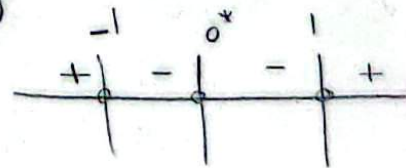
⑥

ب) $y = \frac{x^2 - 3x + 2}{x^2 - 5x + 6}$



② ✓

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



⑦

② ✓

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

$\Delta < 0 \rightarrow \Delta < 0 \cup \Delta > 0 \leftarrow x \in \mathbb{R}$

$$\frac{-2 \pm \sqrt{4 - 14}}{2}$$

$$\frac{-2 \pm \sqrt{4 - 14}}{2}$$