

۱۱، ۱۵

الف) $y^2 = 2x^2 - 1 \Rightarrow \begin{cases} y_1^2 = 2x_1^2 - 1 \\ y_2^2 = 2x_2^2 - 1 \end{cases} \xrightarrow{f(x_1=x_2)} y_1^2 = y_2^2 \Rightarrow y_1 = y_2 \checkmark$ تابع است

ب) $y^2 + y = 2x^2 - 1 \Rightarrow \begin{cases} y_1^2 + y_1 = 2x_1^2 - 1 \\ y_2^2 + y_2 = 2x_2^2 - 1 \end{cases} \xrightarrow{f(x_1=x_2)} y_1^2 + y_1 = y_2^2 + y_2 \Rightarrow y_1^2 - y_2^2 + y_1 - y_2 = 0$
 $\Rightarrow (y_1 - y_2)(y_1 + y_2 + 1) = 0$
 $\Rightarrow y_1 = y_2$ یا $y_1 + y_2 = -1$
 $\Rightarrow y_1 = y_2$ تابع است $\checkmark$

الف) $y = x^2 - 1 \Rightarrow$  تابع است $\checkmark$

ب) $|y| + x = x^2 + 1 \xrightarrow{x=0} |y| = 1 \Rightarrow y = \pm 1$
 $\Rightarrow y = \pm 1$ تابع است $\checkmark$

الف) $\tan \frac{\pi}{4} = \frac{y}{x} = 2 \times 1 = 2 \Rightarrow \frac{\sin 45^\circ}{\cos 45^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

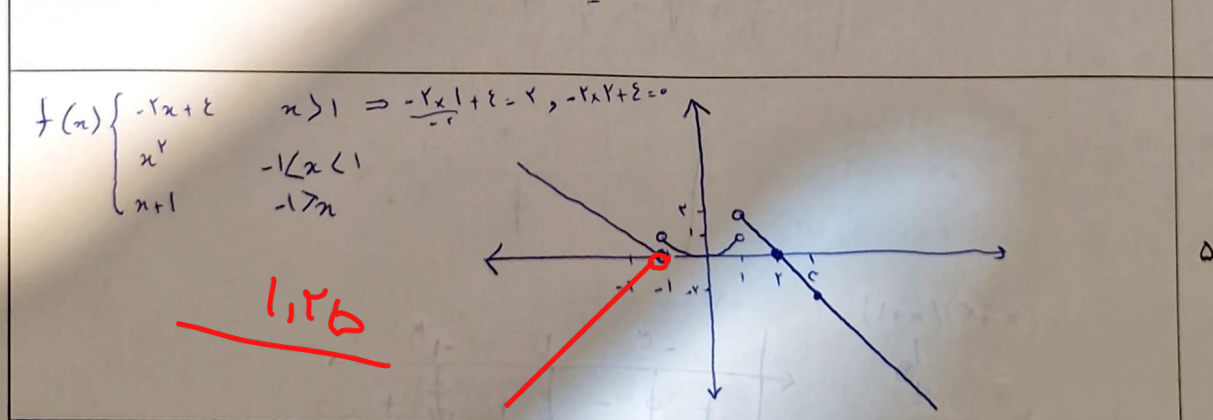
ب) $\cot \frac{\sqrt{\pi}}{4} = \frac{\cos 21.5^\circ}{\sin 21.5^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = \sqrt{2}$

ج) $\tan 88.5^\circ = \frac{\sin 88.5^\circ}{\cos 88.5^\circ} = \frac{\frac{1}{2}}{\frac{\sqrt{2}}{2}} = \frac{1}{\sqrt{2}}$

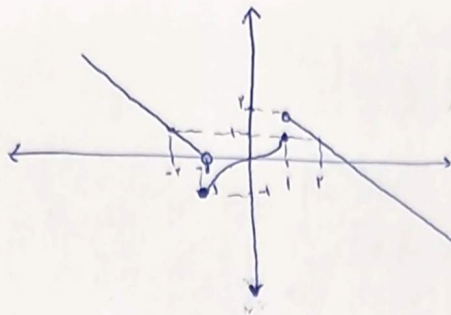
د) $\cot 11.5^\circ = \frac{\cos 11.5^\circ}{\sin 11.5^\circ} = \frac{1}{\frac{1}{2}} = 2$ تقریباً $\checkmark$

الف) $\sin a = \frac{1}{2} \Rightarrow a = 30^\circ, 150^\circ = \frac{\pi}{6}, \frac{5\pi}{6}$

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



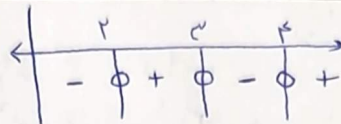
$$f(x) = \begin{cases} -x+1 & x > 1 \\ x^2 & -1 \leq x \leq 1 \\ -x-1 & x < -1 \end{cases}$$



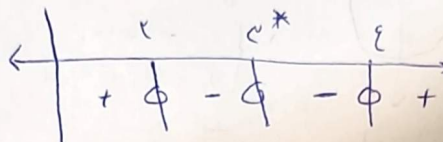
Ⓟ ✓

٦

الف) $y = (x-2)(x-1)(x-3)$



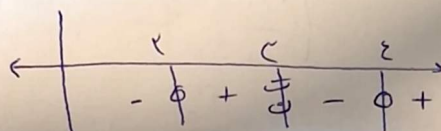
ب) $y = (x-2)(x-1)^2(x-3)$



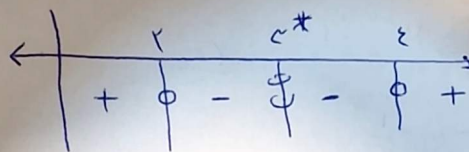
Ⓟ ✓

٧

الف) $y = \frac{(x-2)(x-3)}{x-1}$



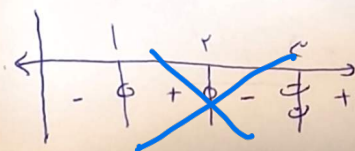
ب) $y = \frac{(x-2)(x-3)}{(x-1)^2}$



Ⓟ ✓

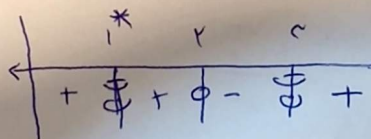
٨

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



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

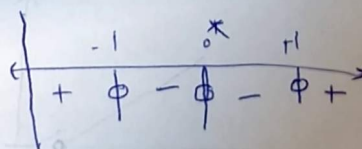
ب) $\frac{x^2-5x+2}{x^2-4x+1} \rightarrow \frac{(x-2)(x-1)}{(x-1)(x-1)}$



Ⓟ

٩

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



فاقد $\Delta = b^2 - 4ac = 1^2 - 4 \times 1 \times 2 = -7$

ب) $\frac{x^2+5x+2}{x^2+2x+1} \rightarrow \Delta = b^2 - 4ac = 25 - 4 \times 1 \times 2 = 9 \rightarrow$ فاقد
 $\Delta = b^2 - 4ac = 4 - 4 \times 1 \times 1 = 0 \rightarrow$ فاقد

Ⓟ ✓

١٠