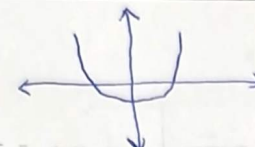


الف) $y^2 = 2x^2 - 1 \Rightarrow \begin{cases} y_1^2 = 2x_1^2 - 1 \\ y_2^2 = 2x_2^2 - 1 \end{cases} \xrightarrow{if(x_1=x_2)} y_1^2 = y_2^2 \Rightarrow y_1 = y_2 \checkmark$ تابع است

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

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

الف) $\tan \frac{\pi}{4} = \frac{y}{x} = 2 \times 0 = 0 \Rightarrow \frac{\sin 45^\circ}{\cos 45^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

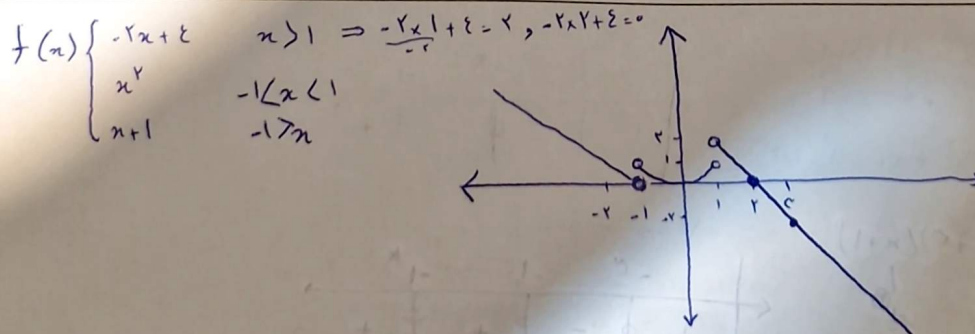
ب) $\cot \frac{\sqrt{\pi}}{4} = \frac{\cos 21.0^\circ}{\sin 21.0^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = \sqrt{2}$

ج) $\tan 88.0^\circ = \frac{\sin 88.0^\circ}{\cos 88.0^\circ} = \frac{\frac{1}{2}}{\frac{\sqrt{2}}{2}} = \frac{1}{\sqrt{2}}$

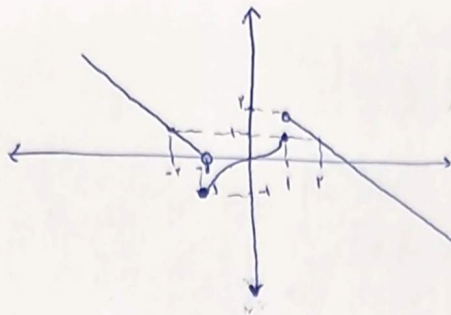
د) $\cot 18.0^\circ = \frac{\cos 18.0^\circ}{\sin 18.0^\circ} = \frac{1}{0} = \infty$

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

ب) $\cos a = \frac{\sqrt{2}}{2} \Rightarrow a = 45^\circ, 135^\circ = \frac{\pi}{4}, \frac{3\pi}{4}$

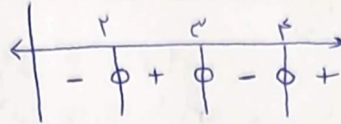


$$f(x) = \begin{cases} -x+c & x > 1 \\ x^c & -1 \leq x \leq +1 \\ -x-1 & x < -1 \end{cases}$$

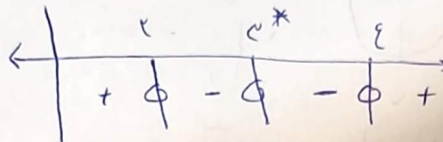


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الف) $y = (x-2)(x-c)(x-\varepsilon)$

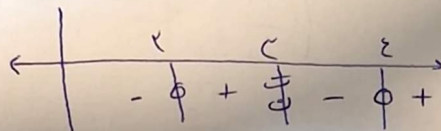


ب) $y = (x-2)(x-c)^2(x-\varepsilon)$

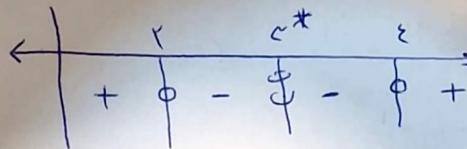


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الف) $y = \frac{(x-2)(x-\varepsilon)}{x-c}$

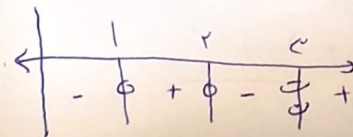


ب) $y = \frac{(x-2)(x-\varepsilon)}{(x-c)^2}$

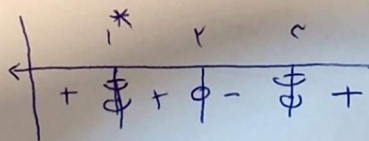


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الف) $\frac{x^c - cx + 2}{x-c} \rightarrow \frac{(x-2)(x-1)}{x-c}$

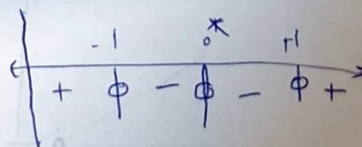


ب) $\frac{x^2 - cx + 2}{x^2 - \varepsilon x + c} \rightarrow \frac{(x-2)(x-1)}{(x-c)(x-1)}$



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الف) $\frac{x^2 - x^2}{x^2 + x + 2} \rightarrow \frac{x^0(x-1)(x+1)}{x^2 + x + 2}$



ناتقد $\Delta = b^2 - 4ac = 1^2 - 4 \times 1 = -3$

ب) $\frac{x^2 + cx + \varepsilon}{x^2 + 2x + c} \rightarrow \Delta = b^2 - 4ac = 2^2 - 4 \times \varepsilon = -4\varepsilon \rightarrow$ ناتقد $\Delta = b^2 - 4ac = 4 - 12 = -8 \rightarrow$ ناتقد

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