

$$1- \text{الف) } y'' = 2x^2 - 1 \rightarrow \begin{cases} y_1'' = 2x_1^2 - 1 \\ y_2'' = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1 = x_2} y_1'' = y_2'' \rightarrow y_1 = y_2$$

تابع است

$$4- \text{ب) } y'' + y = 3x^2 - 1 \rightarrow \begin{cases} y_1'' + y_1 = 3x_1^2 - 1 \\ y_2'' + y_2 = 3x_2^2 - 1 \end{cases} \xrightarrow{x_1 = x_2} y_1'' + y_1 = y_2'' + y_2$$

$$\downarrow$$

$$y_1'' - y_2'' + y_1 - y_2 = 0$$

$$\boxed{y_1 = y_2} \leftarrow y_1 - y_2 = 0$$

$$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2)(a_1 x + b_1 + c_1)$$

$$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1) = 0$$

$$x \text{ متغیر نیست } y_1^2 + y_1 y_2 + y_2^2 + 1 = 0$$

$$y_1 = -(y_2 + 1)$$

$$\hookrightarrow y_1 - y_2 + 1 < 0$$

$$y_1^2 - 4y_2^2 + 4$$

$$2- \text{الف) } y = x^2 - 1 \xrightarrow{\text{مشتق}} y' = 2x$$

$$14- \text{ب) } |y| + x y = x^2 + 1 \rightarrow |y| + 1 \geq 2 \rightarrow |y| = 1 \rightarrow y = \pm 1$$

$$15- x = 1 \text{ متغیر نیست}$$

$$16- \text{ج) } y'' + x' = 2x - 1 \rightarrow y'' = 2x - 1 - x'$$

تابع است

$$18- \begin{cases} y_1'' = 2x_1' - 1 - x_1' \\ y_2'' = 2x_2' - 1 - x_2' \end{cases} \xrightarrow{x_1 = x_2} y_1'' = y_2''$$

تابع است

$$21- \Rightarrow y'' + \sqrt{x} = 2$$



Senobar

$$\text{ا) } \tan \frac{\pi}{4} = \tan 45^\circ \Rightarrow \frac{\sin 45^\circ}{\cos 45^\circ} = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{\sqrt{2}}} = \sqrt{2} \quad -3$$

$$\text{ب) } \cot \frac{\sqrt{2}\pi}{4} = \cot 45^\circ \rightarrow \frac{\cos 45^\circ}{\sin 45^\circ} = \frac{-\frac{\sqrt{2}}{2}}{-\frac{1}{\sqrt{2}}} = \sqrt{2}$$

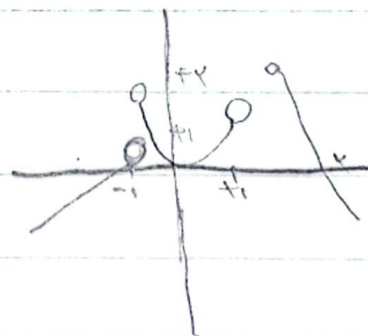
$$\text{ج) } \tan 135^\circ = \frac{\sin 135^\circ}{\cos 135^\circ} = \frac{-\frac{1}{\sqrt{2}}}{\frac{\sqrt{2}}{2}} = -\frac{1}{\sqrt{2}}$$

$$\text{د) } \cot 180^\circ = \frac{\cos 180^\circ}{\sin 180^\circ} = \frac{-1}{0} = \text{undefined}$$

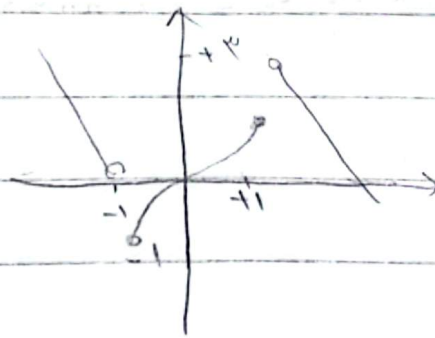
$$\text{ا) } \sin a = \frac{1}{2} \rightarrow a = \frac{\pi}{6}, \frac{5\pi}{6} \quad 0 < a < \pi \quad -4$$

$$\text{ب) } \cos a = \frac{\sqrt{2}}{2} \rightarrow a = \frac{\pi}{4}, \frac{7\pi}{4} \quad \frac{\pi}{4}, \frac{7\pi}{4}$$

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



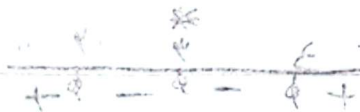
$$f(x) = \begin{cases} -x+1 & x > 1 \\ x^2 & -1 \leq x \leq 1 \\ -x-1 & x < -1 \end{cases}$$



الف) $y = (x-2)(x-3)(x-4)$



ب) $y = (x-2)(x-3)^2(x-4)$



الف) $y = \frac{(x-2)(x-4)}{x-3}$



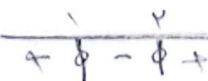
ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$



الف) $y = \frac{x^3 - 3x + 2}{x-2}$

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

$\frac{(x-1)(x-2)}{x^2 - 5x + 3}$



$$a) y = \frac{n^2 - n^2}{n^2 + n + 1} = \frac{(n-0)(n-0)(n-1)(n+1)}{n^2 + n + 1}$$

$\Delta < 0 \rightarrow$ min

$\begin{array}{c} \textcircled{0} \quad \textcircled{0} \quad \textcircled{1} \quad \textcircled{-1} \\ (n-0)(n-0)(n-1)(n+1) \end{array}$

$\begin{array}{c} -1 \quad * \\ + \quad - \quad - \quad + \end{array}$

$\begin{array}{c} 1 \\ 0 \end{array}$

$$b) y_2 = \frac{n^2 + 13n + 12}{n^2 + 14n + 13} \rightarrow \Delta < 0 \text{ Bump}$$

$\Delta < 0$