

← سوال 1

1.1) $y^k = 2n^k - 1$

$$\begin{cases} y_1^k = 2n_1^k - 1 \\ y_2^k = 2n_2^k - 1 \end{cases} \quad n_1 = n_2 \quad y_1^k = y_2^k \rightarrow \text{تابع صحت} \\ \Rightarrow \boxed{y_1 = y_2} \checkmark$$

ب) $y^k + y = 2n^k - 1$

$$\begin{cases} y_1^k + y_1 = 2n_1^k - 1 \\ y_2^k + y_2 = 2n_2^k - 1 \end{cases} \quad n_1 = n_2 \Rightarrow y_1^k + y_1 = y_2^k + y_2 \rightarrow \text{تابع صحت} \\ \Rightarrow y_1^k + y_1 - y_2^k - y_2 = 0 \\ (y_1 - y_2)(y_1^k + y_1 y_2 + y_2^k) + y_1 - y_2 = 0 \Rightarrow (y_1 - y_2)(y_1^k + y_1 y_2 + y_2^k + 1) = 0 \\ \Rightarrow y_1 - y_2 = 0 \rightarrow \boxed{y_1 = y_2} \leftarrow 2 \text{ سوال}$$

ج) $y = n^k - 1$

$$\begin{cases} y_1 = n_1^k - 1 \\ y_2 = n_2^k - 1 \end{cases} \quad n_1 = n_2 \Rightarrow \boxed{y_1 = y_2} \checkmark \rightarrow \text{تابع صحت}$$

د) $|y| + ny = n^k + 1$

1) $n = 0 \Rightarrow |y| = 1 \rightarrow \text{تابع صحت}$

$$y = \begin{matrix} 1 \\ -1 \end{matrix}$$

2) $y^k + n^k = 2n - 1$

$$\begin{cases} y_1^k + n_1^k = 2n_1 - 1 \\ y_2^k + n_2^k = 2n_2 - 1 \end{cases} \quad n_1 = n_2 \Rightarrow y_1^k + n_1^k = y_2^k + n_2^k \rightarrow \text{تابع صحت} \\ \Rightarrow \boxed{y_1 = y_2} \checkmark$$

$$2) \sqrt[n]{x} + \sqrt[n]{n} = r$$

$$\begin{cases} \sqrt[n]{x_1} = r - \sqrt[n]{n_1} & n_1 \neq n \\ \sqrt[n]{x_2} = r - \sqrt[n]{n_2} \end{cases} \rightarrow \sqrt[n]{x_1} = \sqrt[n]{x_2} \rightarrow x_1 = x_2 \quad \checkmark$$

$$a) \tan \frac{\pi}{4} \rightarrow \frac{\sin \frac{\pi}{4}}{\cos \frac{\pi}{4}} \rightarrow \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = \frac{\sqrt{2}}{1} = \sqrt{2}$$

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

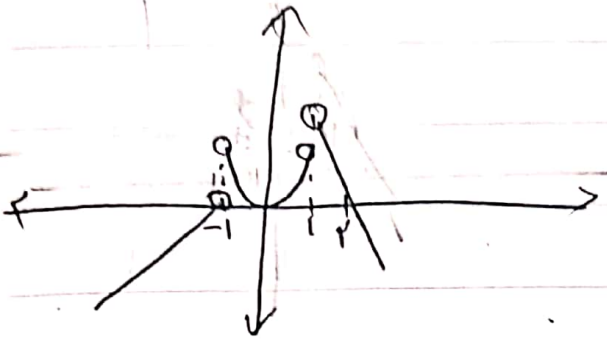
$$c) \tan 135^\circ \rightarrow \frac{\sin 135^\circ}{\cos 135^\circ} \rightarrow \frac{\frac{1}{\sqrt{2}}}{-\frac{1}{\sqrt{2}}} = - \frac{1}{1} = -1$$

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

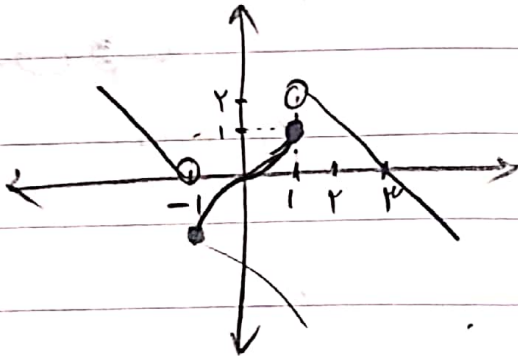
$$e) \sin a = \frac{1}{2} \rightarrow a = \frac{\pi}{6}, \frac{5\pi}{6}$$

$$f) \cos a = \frac{\sqrt{2}}{2} \rightarrow a = \frac{\pi}{4}, \frac{3\pi}{4}$$

← سوال 5

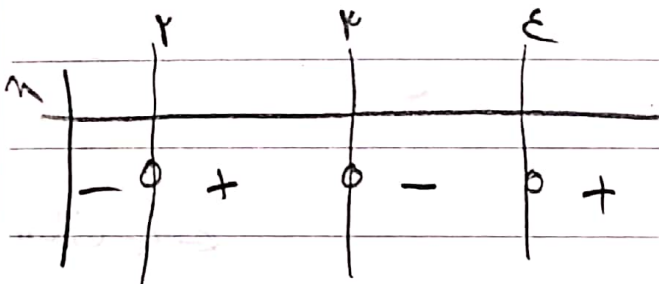


← سوال 6

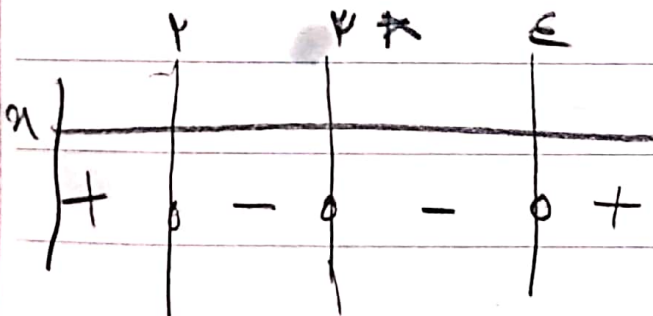


← سوال 7

$$\text{علی } y = (x-1)(x-2)(x-3)$$

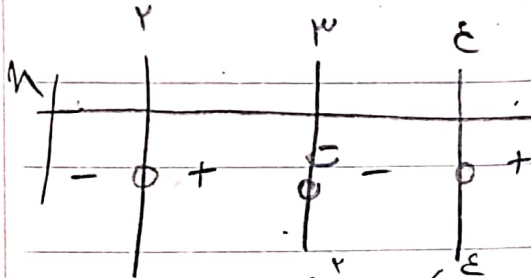


$$\text{علی } y = (x-1)(x-2)(x-3)^2(x-4)$$

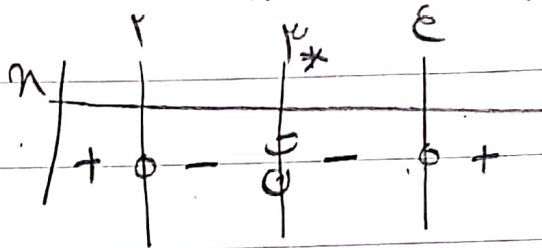


8
سوال 8

$$\text{حل 1) } y = \frac{(x-2)(x-5)}{x-4}$$

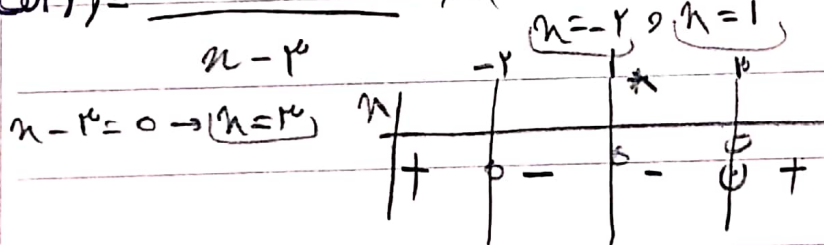


$$\text{ب) } y = \frac{(x-2)(x-5)}{(x-4)^2 - 4}$$



9
سوال 9

$$\text{حل 1) } y = \frac{x^2 - 3x + 2}{x-4} \Rightarrow (x+2)(x-1) = 0$$

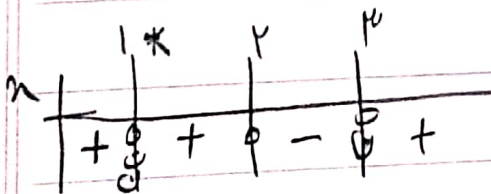


$$\text{ب) } \frac{x^2 - 3x + 2}{x^2 - 5x + 4} \rightarrow \frac{x^2 - 3x + 2}{x^2 - 5x + 4} = \frac{(x-1)(x-2)}{(x-1)(x-4)} = 0$$

$$x=1, x=2$$

$$\frac{x^2 - 5x + 4}{x^2 - 5x + 4} = \frac{(x-1)(x-4)}{(x-1)(x-4)} = 0$$

$$x=1, x=4$$



← 100 hrs

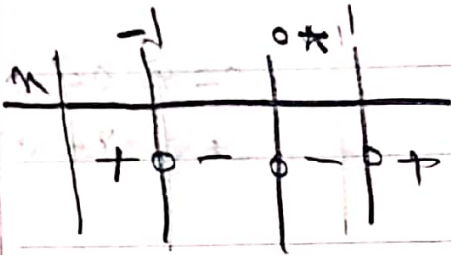
$$\text{ii) } \frac{n^E - n^Y}{n^Y + n + Y} \Rightarrow n^E - n^Y = 0$$

$$\therefore n^Y(n^Y - 1) = 0$$

$$n^Y = 0 \text{ or } n^Y - 1 = 0$$

$$n = 0 \quad n^Y = 1$$

$$n = 1 - 1$$



$$\text{iii) } \frac{n^Y + Yn + E}{n^Y + Yn + Y} \xrightarrow{\text{sign}} \text{sign}$$

$$\Rightarrow \begin{array}{l} \text{Circuit} \rightarrow + \\ \text{Sign} \rightarrow + \end{array} \xrightarrow{1R \text{ and } 1/2 R} \frac{+}{+} = (+)$$