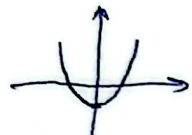


الف) $\begin{cases} y_1^r = 2x_1^r - 1 \\ y_r^r = 2x_r^r - 1 \end{cases} \xrightarrow{x_1=x_r} y_1^r = y_r^r \Rightarrow y_1 = y_r$ تابع است ✓

ب) $\begin{cases} y_1^r + y_r = 2x_1^r - 1 \\ y_r^r + y_r = 2x_r^r - 1 \end{cases} \xrightarrow{x_1=x_r} y_1^r + y_r = y_r^r + y_r \Rightarrow y_1^r - y_r^r + y_r - y_r = 0 \Rightarrow$
 $\Rightarrow (y_1 - y_r)(y_1^r + y_r + y_r^r + y_r + 1) = 0 \Rightarrow (y_1 - y_r)(y_1^r + y_r + y_r^r + 1) = 0 \Rightarrow y_1 - y_r = 0 \Rightarrow y_1 = y_r$ تابع است ✓

الف) $|y| + xy = x + 1 \xrightarrow{x=0} |y| = 1 \Rightarrow y = \pm 1$ تابع نیست ✗


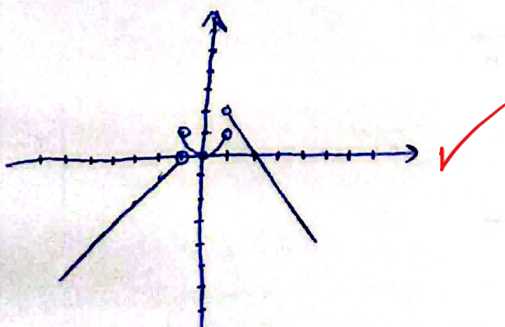
ب) $\begin{cases} y_1^r = -x_1^r + 2x_1 - 1 \\ y_r^r = -x_r^r + 2x_r - 1 \end{cases} \xrightarrow{x_1=x_r} y_1^r = y_r^r \Rightarrow y_1 = y_r$ تابع است ✓
 $\begin{cases} \sqrt{y_1} = -\sqrt{x_1} + 2 \\ \sqrt{y_r} = -\sqrt{x_r} + 2 \end{cases} \xrightarrow{x_1=x_r} \sqrt{y_1} = \sqrt{y_r} \Rightarrow y_1 = y_r$ تابع است ✓

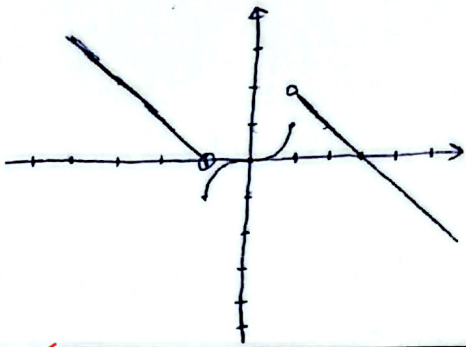
الف) $\begin{cases} \sin \frac{\pi}{3} = \frac{\sqrt{3}}{2} \\ \cos \frac{\pi}{3} = \frac{1}{2} \end{cases} \Rightarrow \tan \frac{\pi}{3} = \frac{\sqrt{3}}{1} = \sqrt{3}$ ✓
 $\begin{cases} \sin \frac{\sqrt{3}\pi}{6} = -\frac{1}{2} \\ \cos \frac{\sqrt{3}\pi}{6} = \frac{\sqrt{3}}{2} \end{cases} \Rightarrow \cot \frac{\sqrt{3}\pi}{6} = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\sqrt{3}$ ✓

ج) $\begin{cases} \sin 330^\circ = -\frac{1}{2} \\ \cos 330^\circ = \frac{\sqrt{3}}{2} \end{cases} \Rightarrow \tan 330^\circ = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$ ✓
 $\sin 180^\circ = 0 \Rightarrow \cot 180^\circ =$ تعریف نشده ✓

الف) $\sin \alpha = \frac{1}{2} \Rightarrow \alpha = \frac{\pi}{6}, \frac{5\pi}{6}$ ✓

ب) $\cos \alpha = \frac{\sqrt{2}}{2} \Rightarrow \alpha = \frac{\pi}{4}, \frac{7\pi}{4}$ ✓





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✓ الف) $y = (n-r)(n-r)(n-r)$

$$\begin{array}{ccccccc} & r & & r & & r & \\ & | & & | & & | & \\ - & 0 & + & 0 & - & 0 & + \end{array}$$

صفه‌ها رو خط‌ها بنویس

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✓ ب) $y = (n-r)(n-r)^*(n-r)$

$$\begin{array}{ccccccc} & r & & r^* & & r & \\ & | & & | & & | & \\ + & 0 & - & 0 & - & 0 & + \end{array}$$

✓ ج) $y = \frac{(n-r)(n-r)}{n-r}$

$$\begin{array}{ccccccc} & r & & r & & r & \\ & | & & | & & | & \\ - & 0 & + & 0 & - & 0 & + \end{array}$$

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✓ د) $y = \frac{(n-r)(n-r)}{(n-r)^r}$

$$\begin{array}{ccccccc} & r & & r^* & & r & \\ & | & & | & & | & \\ + & 0 & - & 0 & - & 0 & + \end{array}$$

✓ الف) $y = \frac{n^r - rn + r}{n-r}$

$$\begin{array}{r} n^r - rn + r \\ -n^r + n \\ \hline n^r - rn + r \\ -n^r + n \\ \hline -rn + r \\ r - r \\ \hline 0 \end{array}$$

$$\frac{n-1}{n^r + n - r} = \frac{n-1}{(n+r)(n-1)}$$

$y = \frac{(n+r)(n-1)}{n-r}$

$$\begin{array}{ccccccc} & r & & r^* & & r & \\ & | & & | & & | & \\ + & 0 & - & 0 & - & 0 & + \end{array}$$

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✓ ب) $y = \frac{n^r - rn + r}{n-r} = \frac{(n-1)(n-r)}{(n-1)(n-r)}$

$$\begin{array}{ccccccc} & r^* & & r & & r & \\ & | & & | & & | & \\ + & 0 & + & 0 & - & 0 & + \end{array}$$

✓ ج) $y = \frac{n^r(n-1)(n+1)}{n^r + n + r}$

$$\begin{array}{ccccccc} & -1 & & r^* & & 1 & \\ & | & & | & & | & \\ + & 0 & - & 0 & - & 0 & + \end{array}$$

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~~$y = \frac{(n+r)(n+1)}{(n+r)(n+1)}$~~

✓ د) $\frac{n^r + rn + r}{n^r + 2n + r} \rightarrow \Delta < 0$

چون دلتا در صورت و مخرج کمتر از ۰ است
بنابراین عبارت همیشه مثبت است