

الف) $y^3 = 2x^3 - 1 \Rightarrow \left. \begin{matrix} y_1^3 - 2x_1^3 + 1 = 0 \\ y_2^3 - 2x_2^3 + 1 = 0 \end{matrix} \right\} \xrightarrow{\text{منها}} y_1^3 + 1 = y_2^3 + 1 \Rightarrow y_1 = y_2 \checkmark$

ب) $y^3 + y = 3x^3 - 1 \Rightarrow \left. \begin{matrix} y_1^3 + y_1 - 3x_1^3 + 1 = 0 \\ y_2^3 + y_2 - 3x_2^3 + 1 = 0 \end{matrix} \right\} \xrightarrow{\text{منها}} y_1^3 + y_1 + 1 = y_2^3 + y_2 + 1 \Rightarrow y_1 = y_2 \checkmark$

$y_1^3 + y_1 - y_2^3 - y_2 = 0 \Rightarrow y_1^3 - y_2^3 + y_1 - y_2 = 0$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2) = 0 \Rightarrow (y_1 - y_2)(y_1^2 + y_2^2 + y_1 y_2) = 0 \Rightarrow y_1 = y_2 \checkmark$

الف) $x^2 - 1$ ب) $|y| + xy = x^2 + 1 \xrightarrow{x=0} |y| = 1 \Rightarrow y = \pm 1 \times$



ج) $y^3 + x^3 = 2x - 1 \xrightarrow{x=0} y^3 = -1 \Rightarrow y = -1 \checkmark$

د) $\sqrt[3]{y} + \sqrt[3]{x} = 2$

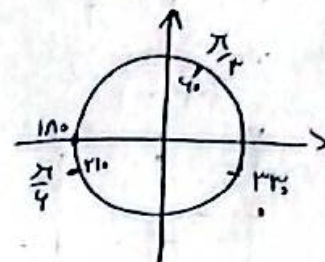
$\left. \begin{matrix} \sqrt[3]{y_1} + \sqrt[3]{x_1} - 2 = 0 \\ \sqrt[3]{y_2} + \sqrt[3]{x_2} - 2 = 0 \end{matrix} \right\} \xrightarrow{\text{منها}} (\sqrt[3]{y_1} - \sqrt[3]{y_2}) = (\sqrt[3]{x_2} - \sqrt[3]{x_1}) \Rightarrow y_1 = y_2 \checkmark$

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

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

ج) $\tan 3\pi/4 = \frac{\sin 135^\circ}{\cos 135^\circ} = \frac{\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = -1$

د) $\cot 135^\circ = -1$



الف) $\sin \alpha = \frac{1}{2}$



$D_f = \{\frac{\pi}{6}, \pi - \frac{\pi}{6}\}$

$0 < \alpha < 2\pi$

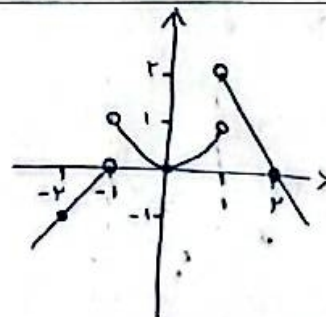
ب) $\cos \alpha = \frac{\sqrt{2}}{2}$



$D_f = \{\frac{\pi}{4}, 2\pi - \frac{\pi}{4}\}$

$$f(x) = \begin{cases} -2x+4 & x > 1 \\ x^2 & -1 < x < 1 \\ x+1 & x < -1 \end{cases}$$

$\begin{matrix} x=1 \rightarrow y=2 \\ x=2 \rightarrow y=0 \\ x=-1 \rightarrow y=0 \\ x=-2 \rightarrow y=-1 \end{matrix}$



$$3) y = (n-r)(n-r)'(n-r)$$

	r	s	t
$n-r$	-	+	+
$n-s$	+	+	+
$n-t$	-	-	+

$$\therefore y = \frac{(n-2)(n-4)}{(n-3)^2}$$

	r_1	r_2	r_3
r_1	-	+	+
r_2	-	-	+
r_3	+	+	+

$$\therefore \frac{n^r - p n + r}{n^r - r n + r} \rightarrow (n-1)(n-r)$$

	± 1	r	w
$n^r = n+r$	+	0	-
$n^r = n+w$	+	0	-
	+	0	-

ج) $\frac{n^2 + 3n + 4}{n^2 + 2n + 3} \rightarrow \Delta < 0$ $\frac{n^2 + 2n + 3}{n^2 + 2n + 3} \rightarrow \Delta < 0$
 معمولی مثبت

$\begin{array}{ccc} -1 & 0 & +1 \\ + & - & + \end{array}$