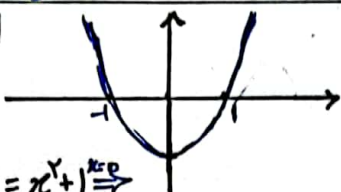


الف) $y^2 = x^2 - 1 \Rightarrow y_1^2 = x_1^2 - 1$
 $y_2^2 = x_2^2 - 1$ تابع است
 $\Rightarrow x_1 = x_2 \Rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2$

ب) $y^2 + y = x^2 - 1 \Rightarrow y_1^2 + y_1 = x_1^2 - 1$
 $y_2^2 + y_2 = x_2^2 - 1$ تابع است
 $\Rightarrow x_1 = x_2 \Rightarrow y_1^2 + y_1 = y_2^2 + y_2 \Rightarrow y_1^2 - y_2^2 + y_1 - y_2 = 0 \Rightarrow (y_1 - y_2)(y_1 + y_2 + 1) = 0 \Rightarrow y_1 = y_2$

① $(y_1 - y_2)(y_1^2 + y_1 + y_2^2 + y_2 + 1) = 0 \Rightarrow$
 $\Delta = y_1^2 - 4y_1 + y_2^2 - 4y_2 + 4 = 0 \Rightarrow y_1 = y_2$ (شبهه)

الف) $y = x^2 - 1$
 تابع است



ب) $|y| + xy = x^2 + 1 \Rightarrow$
 $|y| = 1 \Rightarrow y = \pm 1$
 تابع نیست

ج) $y^2 + x^2 = 2x - 1 \Rightarrow y_1^2 = -x_1^2 + 2x_1 - 1$
 $y_2^2 = -x_2^2 + 2x_2 - 1$ تابع است
 $\Rightarrow x_1 = x_2 \Rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2$

د) $\sqrt{y} + \sqrt{x} = 2 \Rightarrow \sqrt{y} = 2 - \sqrt{x} \Rightarrow$
 $\sqrt{y_1} = 2 - \sqrt{x_1} \Rightarrow \sqrt{y_2} = 2 - \sqrt{x_2} \Rightarrow y_1 = y_2$ تابع هست

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

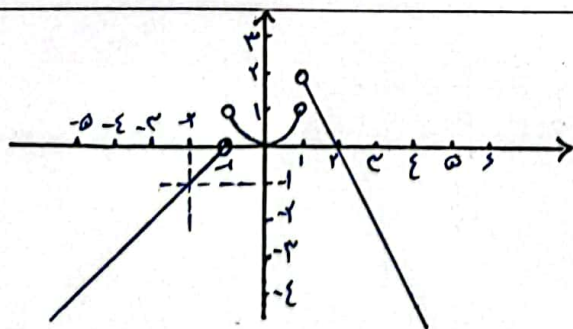
ب) $\cot \frac{3\pi}{4} = \frac{\cos \frac{3\pi}{4}}{\sin \frac{3\pi}{4}} = \frac{-\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = -1$

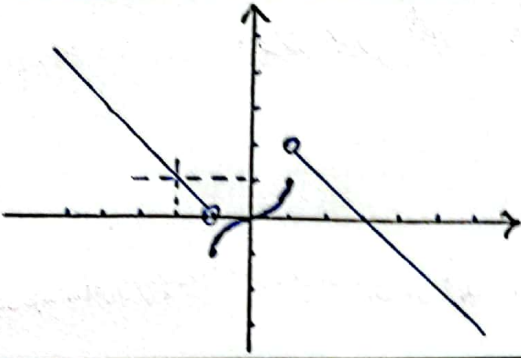
ج) $\tan 225^\circ = \frac{\sin 225^\circ}{\cos 225^\circ} = \frac{-\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = 1$

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

الف) $\sin \alpha = \frac{1}{4} \Rightarrow \alpha = \left\{ \frac{\pi}{6}, \frac{5\pi}{6} \right\}$

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





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الف) $y = (x-1)(x-2)(x-3)$
 $x=1 \quad x=2 \quad x=3$

x	1	2	3	4
$f(x)$	-	+	-	+

ب) $y = (x-1)(x-2)(x-3)$ (بما أن $x=1, 2, 3$ هي جذور المعادلة)

x	1	2	3	4
$f(x)$	+	-	+	-

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الف) $y = \frac{(x-1)(x-3)}{x-2}$

x	1	2	3	4
$f(x)$	-	+	-	+

ب) $y = \frac{(x-1)(x-3)}{(x-2)^2}$

x	1	2	3	4
$f(x)$	+	-	+	-

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الف) $y = \frac{x^2 - 2x + 2}{(x-1)^2}$

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

$\frac{x^2 - 2x + 2}{x^2 - 2x + 2} = \frac{x^2 - 2x + 2}{x^2 - 2x + 2}$
 $\frac{x^2 - 2x + 2}{x^2 - 2x + 2} = \frac{x^2 - 2x + 2}{x^2 - 2x + 2}$

x	1	2	3	4
$f(x)$	+	-	+	-

x	1	2	3	4
$f(x)$	+	-	+	-

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الف) $y = \frac{x^2 - x}{x^2 + x + 2}$

ب) $\frac{x^2 - x}{x^2 + x + 2} = \frac{x(x-1)}{(x+2)(x-1)}$

x	-1	0	1	2
$f(x)$	-	+	-	+

x	$-\infty$	$+\infty$
$f(x)$	+	+

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