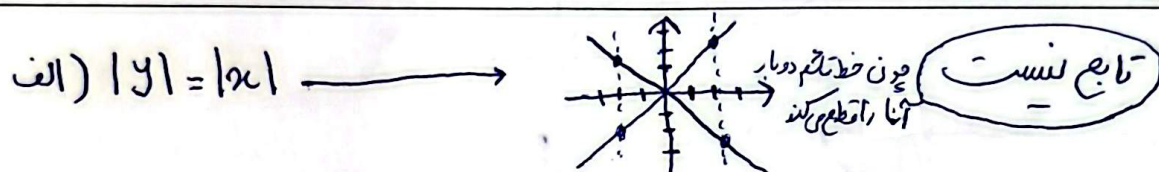


برای اینکه رابطه f تابع شود باید هر زوج مرتب را که درایی اول آنها برابر باشد باید دومی برابر باشد پس باید این دو زوج مرتب یکی باشند تا رابطه f تابع شود. $(1, 4a), (1, a^2+3) \Rightarrow y_1 = y_2 \mid x_1 = x_2$ و $(x_1, y_1), (x_2, y_2)$

$$fa = a^2 + 3 \Rightarrow a^2 + 3 - 4a = 0 \Rightarrow a^2 - 4a + 3 = 0 \Rightarrow a = \frac{4 \pm \sqrt{16 - 12}}{2} = \frac{4 \pm 2}{2} \Rightarrow a = \{1, 3\}$$

or $(a-1)(a-3) = 0 \Rightarrow a = \{1, 3\}$



ب) $|y| + \sqrt{x-1} = 0$

$|y| = 0 \Rightarrow y = 0$
 $\sqrt{x-1} = 0 \Rightarrow x = 1$

الف) $|y-1| = \sqrt{x-2}$ if $x=3 \Rightarrow |y-1| = \sqrt{3-2} \Rightarrow |y-1| = 1 \Rightarrow y = \{0, 2\}$

ب) $y^5 - y = \frac{x^2}{4}$ if $x=0 \Rightarrow y^5 - y = 0 \Rightarrow y(y^4 - 1) = 0 \Rightarrow y = \{0, 1, -1\}$

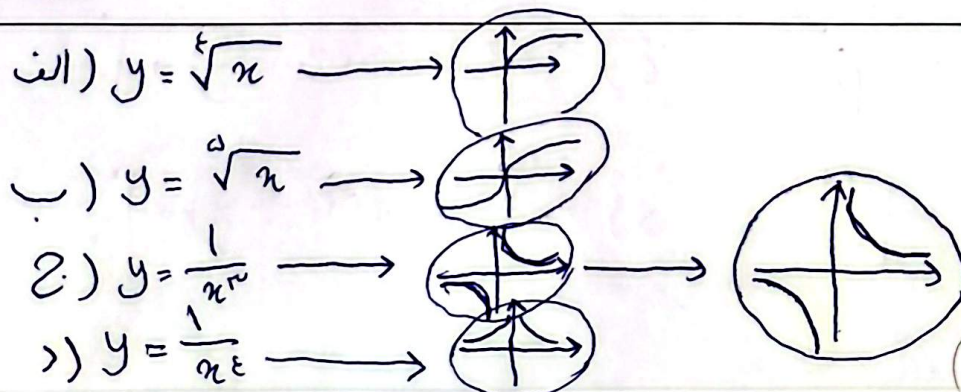
ج) $\sin^2 x + \cos^2 \frac{y}{4} = 1$ if $x=0 \Rightarrow \cos^2 \frac{y}{4} = 1 \Rightarrow y = \{0, 3\}$

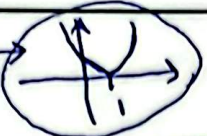
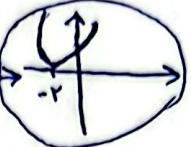
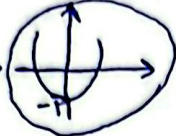
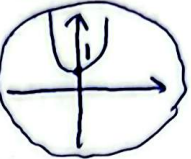
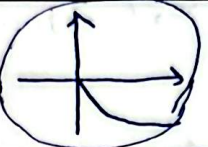
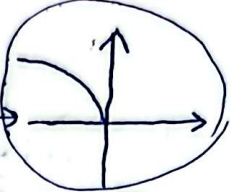
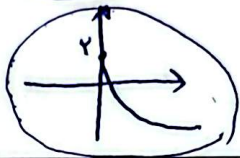
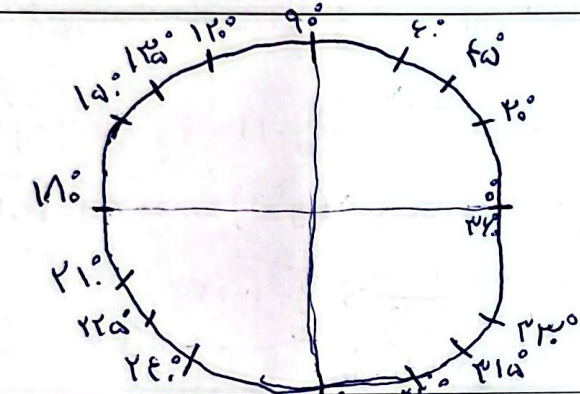
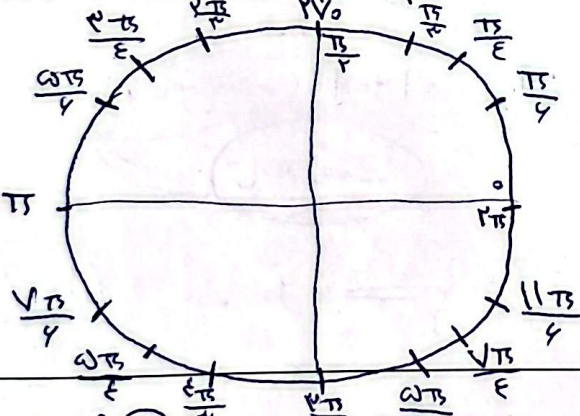
د) $2xy = x$ if $x=0 \Rightarrow 0 \cdot y = 0 \Rightarrow y = \mathbb{R}$

الف) $x^2 + |y-1| = 4x$ if $x=1 \Rightarrow 1 + |y-1| = 4 \Rightarrow |y-1| = 3 \Rightarrow y = \{4, -2\}$

تابع نیست

ب) $y^5 + 3x = 0$ $y_1^5 + 3x_1 = 0 \Rightarrow y_1^5 = -3x_1$
 $x_1 = y_1 \mid x_2 = y_2 \Rightarrow y_1 = y_2$
 $y_2^5 + 3x_2 = 0 \Rightarrow y_2^5 = -3x_2$
 $\Rightarrow y_1^5 = y_2^5 \Rightarrow y_1 = y_2$



الف) $y = (x-1)^2$ →  ب) $y = (x+2)^2$ →  ج) $y = x^2 - 2$ →  د) $y = x^2 + 1$ → 	٦
الف) $y = -\sqrt{x}$ →  ب) $y = \sqrt{-x}$ →  ج) $y = -\sqrt{-x}$ →  د) $y = -\sqrt{x+2}$ → 	٧
	٨
	٩
الف) $\cos 120^\circ = \left(-\frac{1}{2}\right)$ → $\left \frac{-\frac{1}{2}}{\frac{1}{2}} \right$ ب) $\sin 150^\circ = \left(\frac{1}{2}\right)$ → $\left \frac{\frac{1}{2}}{\frac{1}{2}} \right$ ج) $\cos \frac{5\pi}{6} = \cos 150^\circ = \left(-\frac{1}{2}\right)$ → $\left \frac{-\frac{1}{2}}{\frac{1}{2}} \right$ د) $\sin \frac{11\pi}{6} = \sin 330^\circ = \left(-\frac{1}{2}\right)$ → $\left \frac{-\frac{1}{2}}{\frac{1}{2}} \right$	١٠