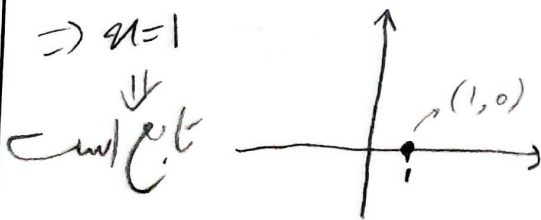


$$f = \{(1, 4a), (1, a^2 + 3), (2, 3a)\}$$

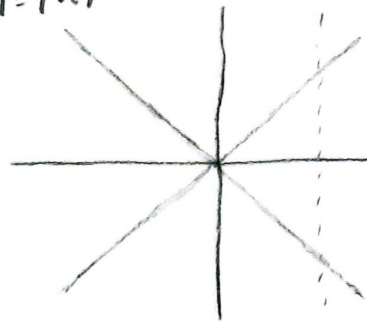
$$4a = a^2 + 3 \Rightarrow a^2 - 4a + 3 = 0 \Rightarrow (a-3)(a-1) = 0 \Rightarrow \begin{cases} a=3 \\ a=1 \end{cases}$$

۱

(ب) از آنجا که این دو عبارت نمی توانند منفی باشند پس هم $y=0$ هم $x-1=0$
 $\Rightarrow x=1$



$$|y|=|x|$$



(الف) درست از این نقطه قطع شده پس تابع نیست

۲

$$\sqrt{x-2}=1 \Rightarrow \begin{cases} y=0 \rightarrow |x-1|=1 \\ y=2 \rightarrow |x-1|=1 \end{cases}$$

$$x=0 \Rightarrow \begin{cases} y=0 \\ y=1 \end{cases}$$

$$x=0 \Rightarrow \sin^2 x = 0 \rightarrow \cos^2 \frac{y}{2} = 1 \rightarrow \begin{cases} \frac{y}{2} = 180^\circ \\ \frac{y}{2} = 0^\circ \end{cases} \rightarrow \begin{cases} y = 360^\circ \\ y = 0^\circ \end{cases} \rightarrow \begin{cases} y = 180^\circ \\ y = 360^\circ \end{cases}$$

$$x=0 \Rightarrow y=0 \rightarrow x=0 \Rightarrow \text{هر عددی می تواند باشد}$$

۳

$$x^2 + |y-1| = 4x \rightarrow |y-1| = 4x - x^2 \xrightarrow{\text{منفی}} x=1 \Rightarrow \left(\frac{1}{4}\right)^{\frac{3}{4}} = 3 \Rightarrow$$

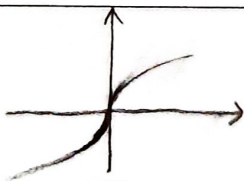
$$|y-1| = 3 \Rightarrow \begin{cases} y=-2 \\ y=4 \end{cases}$$

تابع نیست X

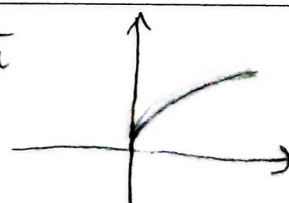
۴

از آنجا که برای هر x فقط یک y داریم پس تابع است. ✓
 $x^2 + 3x = 0 \rightarrow x = -3x \rightarrow y = \sqrt{-3x}$

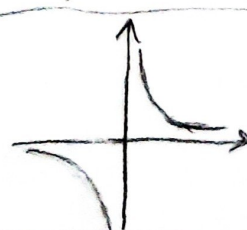
$$y = \sqrt[5]{x}$$



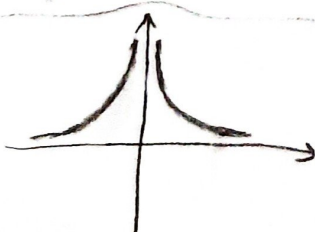
$$(ب) y = \sqrt[4]{x}$$



$$(ج) y = \frac{1}{x^3}$$



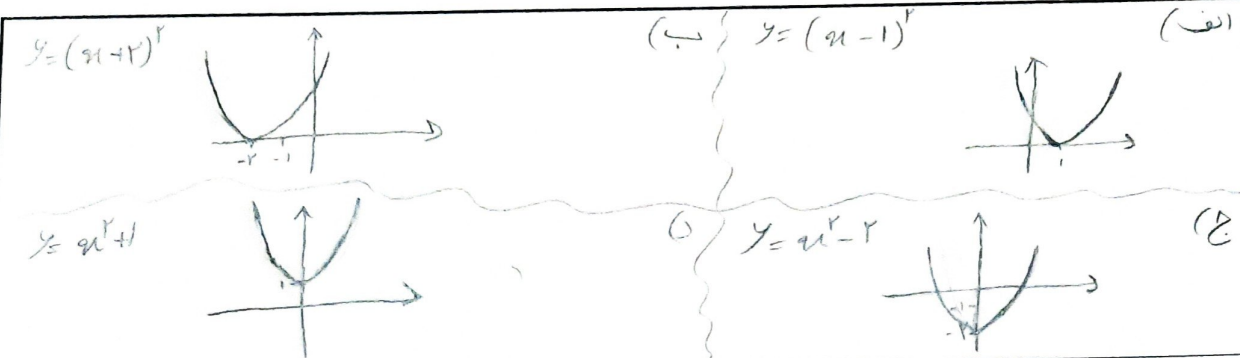
$$y = \frac{1}{x^4}$$



(ج)

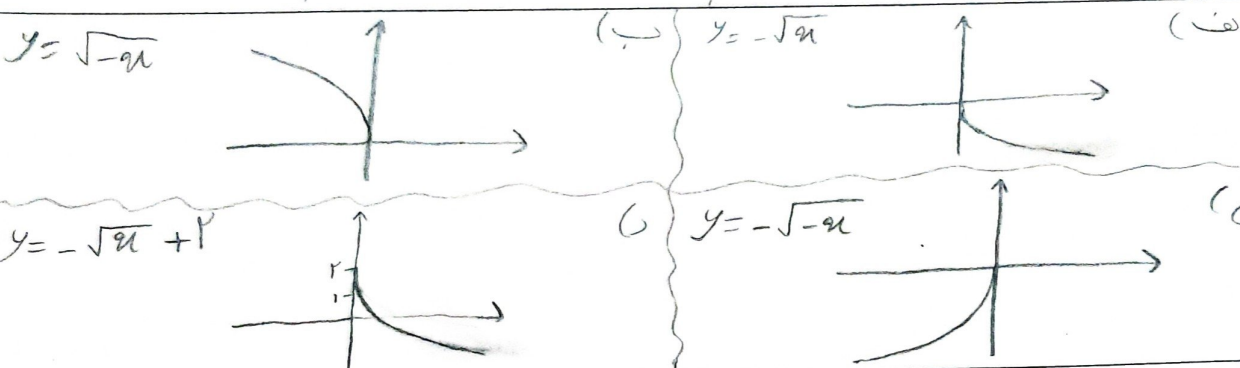
۵

تصنيف:



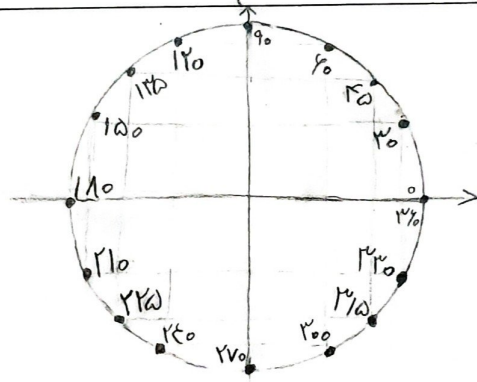
٤

(ج)

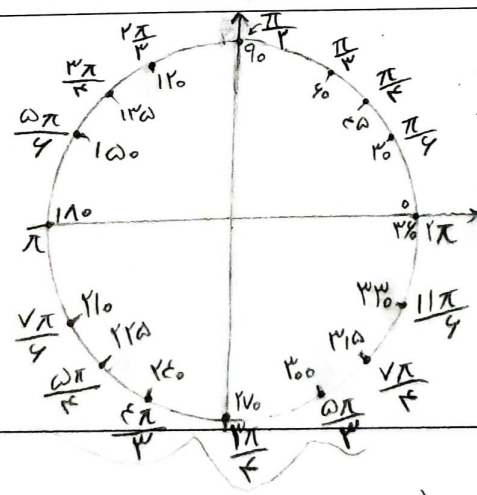


٧

(ج)



٨



٩

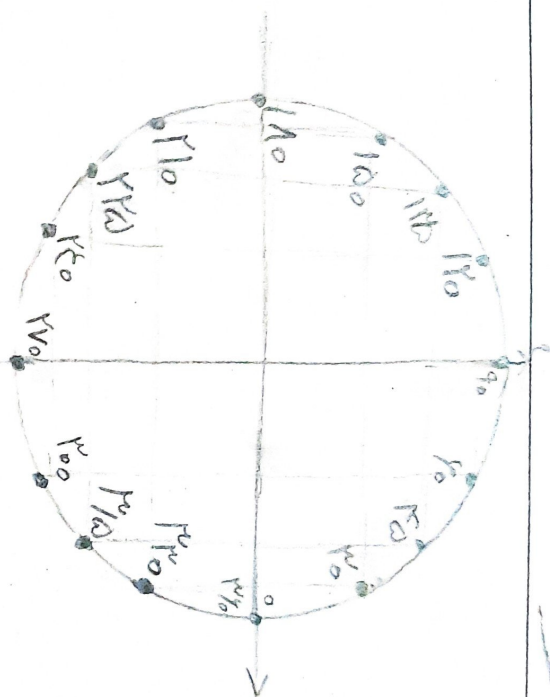
الف) $\cos 120^\circ = -\frac{1}{2}$

ب) $\sin 150^\circ = \frac{1}{2}$

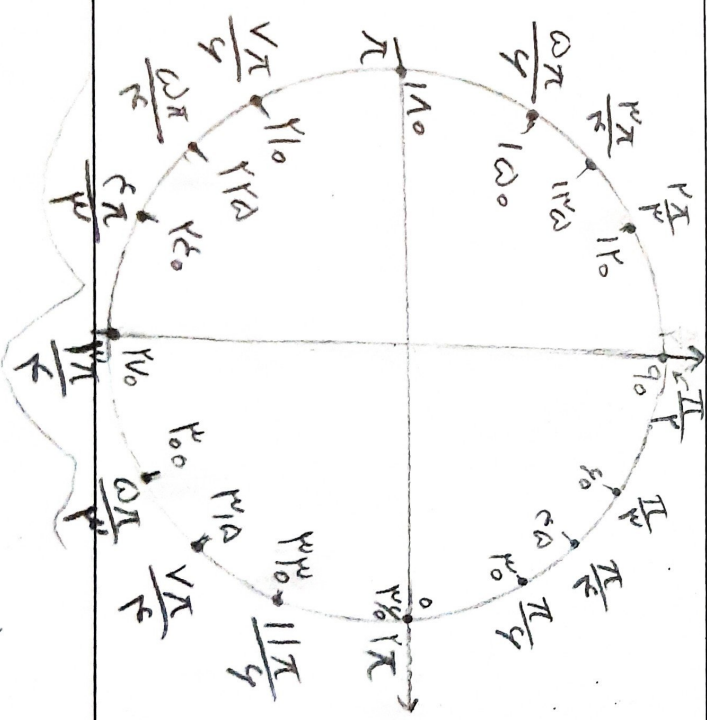
ج) $\cos \frac{5\pi}{6} = -\frac{1}{2}$

د) $\sin \frac{11\pi}{6} = -\frac{1}{2}$

١٠



1



2

$$\cos 110^\circ = -\frac{1}{2}$$

$$\sin 110^\circ = \frac{1}{2}$$