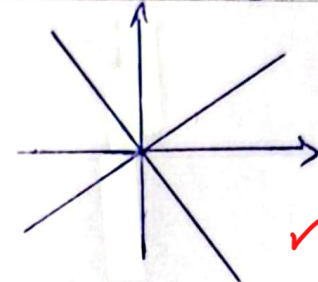
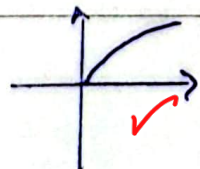
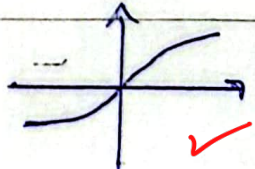
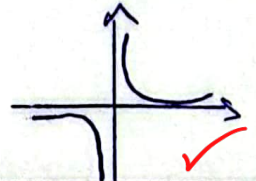
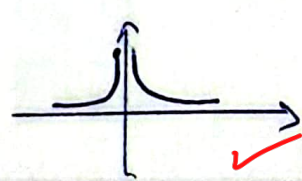


۱. تابع $f = \{(1, 2), (2, 3), (3, 4)\}$ $f(a) = a^2 + 3 \Rightarrow a^2 - f(a) + 3 = 0$
 طبق شرط $a+b+c=0$ $\Rightarrow \begin{cases} a=1 \\ a=3 \end{cases} \Rightarrow f = \{(1, 2), (2, 3), (3, 4)\}$
 ۲. تابع $f = \{(1, 4), (2, 9), (3, 16)\}$
 تابع f برای $a=1$ و $a=3$ تابع است.

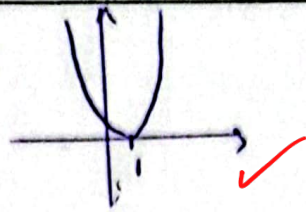
الف) $|y| = |x| \Rightarrow$ 
 تابع نیست چون خط متقاطع آن دارد پس از این نقطه قطع می‌کند.
 ب) $|y| + \sqrt{x-1} = 0 \Rightarrow |y|=0 \Rightarrow y=0 \Rightarrow \sqrt{x-1}=0 \Rightarrow x=1$
 تابع است چون فقط در نقطه $(1, 0)$ قطع می‌کند.

الف) $|y-1| = \sqrt{x-2} \Rightarrow y-1 = 2 \Rightarrow y=3$
 ب) $y^2 - y = \frac{x^2}{4} \Rightarrow y^2 - y = 0 \Rightarrow y=0$
 ج) $\sin^2 x + \cos^2 \frac{y}{4} = 1 \Rightarrow \cos^2 \frac{y}{4} = 1 - \sin^2 x \Rightarrow \cos^2 \frac{y}{4} = \cos^2 x \Rightarrow \frac{y}{4} = x \Rightarrow y=4x$
 د) $2\pi y = x \Rightarrow y \in \mathbb{R}$ تابع نیست.

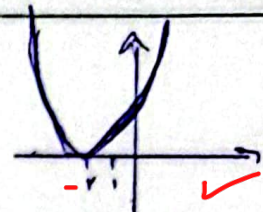
الف) $x^2 + |y-1| = 4x \Rightarrow |y-1| = -x^2 + 4x \Rightarrow |y-1| = 3$
 $\Rightarrow \begin{cases} y=4 \\ y=-2 \end{cases}$
 ب) $y^2 + 3x = 0 \Rightarrow \begin{cases} y_1^2 = -3x_1 \\ y_2^2 = -3x_2 \end{cases} \Rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2$
 تابع است.

الف) $y = \sqrt{x} \Rightarrow$ 
 ب) $y = \sqrt[3]{x} \Rightarrow$ 
 ج) $y = \frac{1}{x^2} \Rightarrow$ 
 د) $y = \frac{1}{x^4} \Rightarrow$ 

الف) $y = (x-1)^2 \Rightarrow$

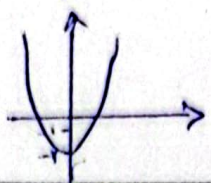


ب) $y = (x+2)^2 \Rightarrow$

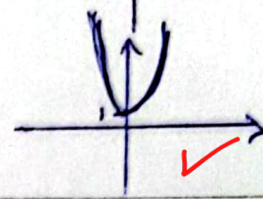


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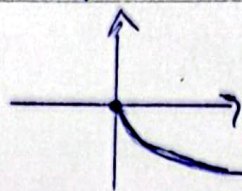
ج) $y = x^2 - 2 \Rightarrow$



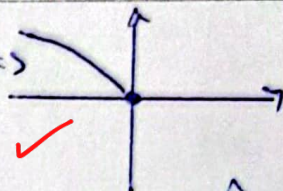
د) $y = x^2 + 1 \Rightarrow$



الف) $y = \sqrt{x} \Rightarrow$

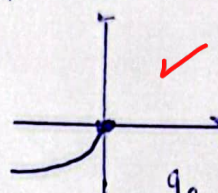


ب) $y = \sqrt{-x} \Rightarrow$

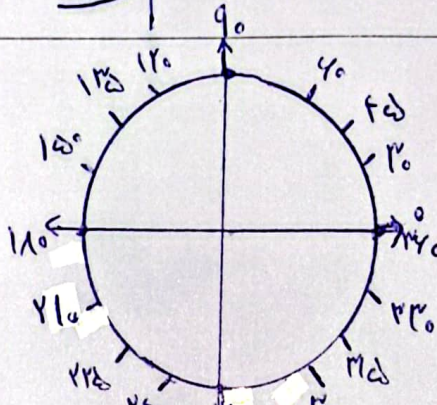
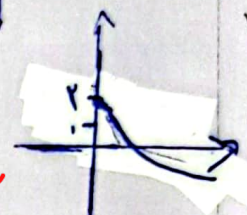


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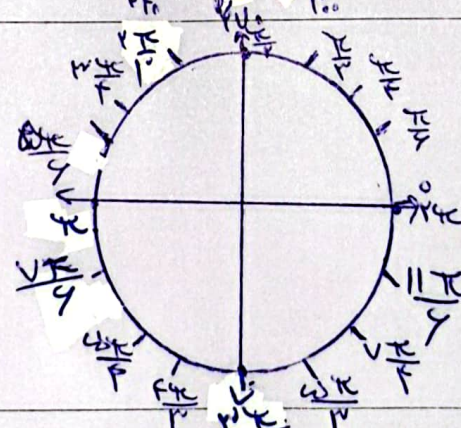
ج) $y = -\sqrt{x} \Rightarrow$



د) $y = -\sqrt{x+2} \Rightarrow$



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الف) $\cos 120^\circ = -\frac{1}{2}$

ب) $\sin 150^\circ = \frac{1}{2}$

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

د) $\sin \frac{4\pi}{3} = -\frac{1}{2}$

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