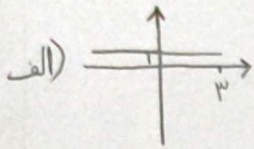


الف) $y^3 - x = 2x^2$ تابع است
 $y_1^3 = 2x^2 - x$ $y_2^3 = 2x^2 - x$ $\Rightarrow y_1^3 = y_2^3$
 $y_1 = y_2$

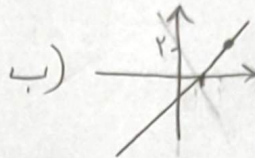
ج) $\sqrt{x-4} + |y-2| = 0$ تابع است
 $\sqrt{x-4} = 0 \Rightarrow x=4$
 $|y-2| = 0 \Rightarrow y=2$

ب) $|y| + x^2 = x + 3$ تابع نیست
 $|y_1| = x + 3 - x^2$ $|y_2| = x + 3 - x^2$
 $|y_1| = |y_2|$
 $|y_1| = x + 3 - x^2$ $|y_2| = x + 3 - x^2$
 $\pm y_1 \neq \pm y_2$

$\Rightarrow x = \cos y$ $0 = \cos y$ 90° تابع نیست
 $\cos y \rightarrow 270^\circ$



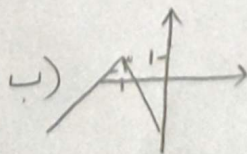
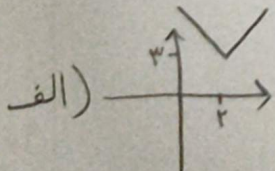
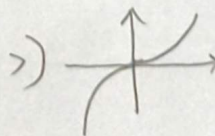
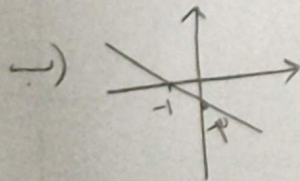
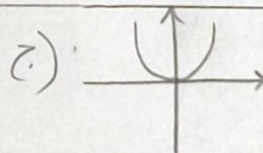
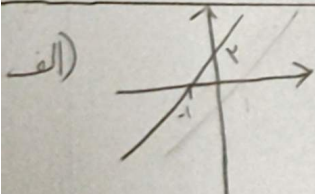
$f(x) = 1$



$f(x) = 2x - 1$

الف) $y = ax + b$ $ax + b = x$ $b = 0$ $a = 1$ $a + 2b = 1 + 2(0) = 1$

ب) $y = x^2 + ax + b$ $x = \frac{-b}{2a} = 2$ $-b = 4a$
 $b = -4a$
 $a + 2b = a + 2(-4a) = a - 8a = -7a$



الف) $x^2 - 4x > 0$ $x(x-4) > 0$ $D_f = \mathbb{R} - (0, 4)$

ب) $x^2 - 7x + 12 > 0$ $\Delta = 49 - 48 = 1 < 0$ $D_f = \mathbb{R} - (-\infty, +\infty)$

ج) $x^2 + x + 4 > 0$ $\Delta = 1 - 16 = -15 < 0$ $D_f = \mathbb{R}$

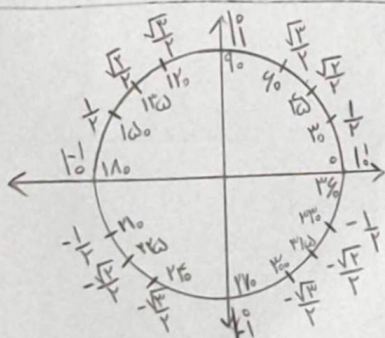
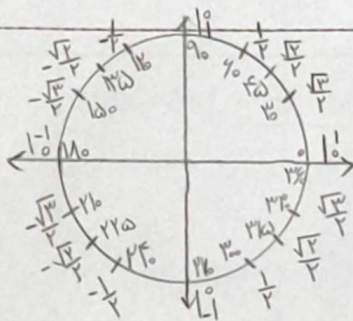
د) $x^2 - 4x^2 > 0$ $D_f = \mathbb{R} - (-1, 0, 1)$ $x^2(x^2-4) > 0$ $x^2(x-2)(x+2) > 0$ $x=0$ $x=2$ $x=-2$

الف) $y = \sqrt{x-1} + \sqrt{x-2}$ $x-1 \geq 0$ $x-2 \geq 0$ $x \geq 2$ $D_f = [2, +\infty)$

ب) $y = \frac{x^2+1}{x^2+1}$ $x^2+1 \neq 0$ $D_f = \mathbb{R}$

ج) $y = \frac{\sqrt{x-2}}{x-4}$ $\sqrt{x-2} \geq 0$ $x-2 \geq 0$ $x \geq 2$ $x-4 \neq 0$ $x \neq 4$ $D_f = [2, +\infty) - \{4\}$

د) $y = \frac{x^2+x+3}{|x|+x^2}$ $|x|+x^2 > 0$ $x^2 > -|x|$ $D_f = \mathbb{R} - 0$



الف) $\cos \frac{2\pi}{3} = -\frac{1}{2} \rightarrow \sin \frac{5\pi}{6} = \frac{1}{2}$

ب) $\cos \frac{11\pi}{6} = \frac{\sqrt{3}}{2} \rightarrow \sin \frac{7\pi}{6} = -\frac{1}{2}$