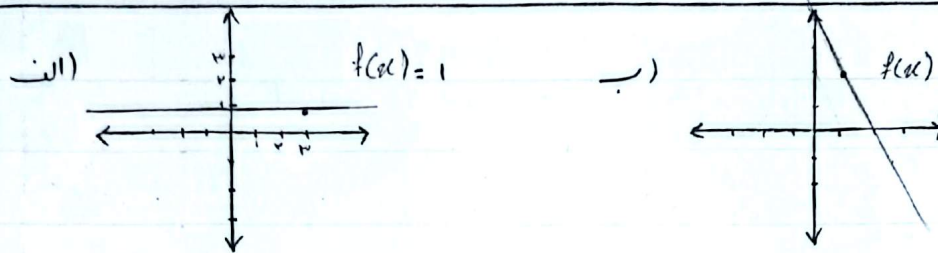
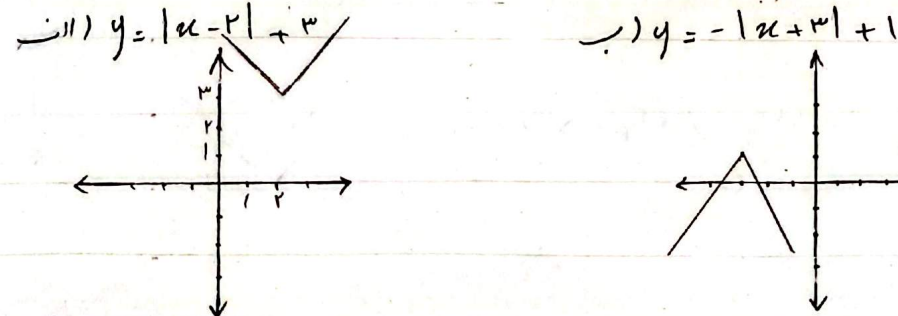
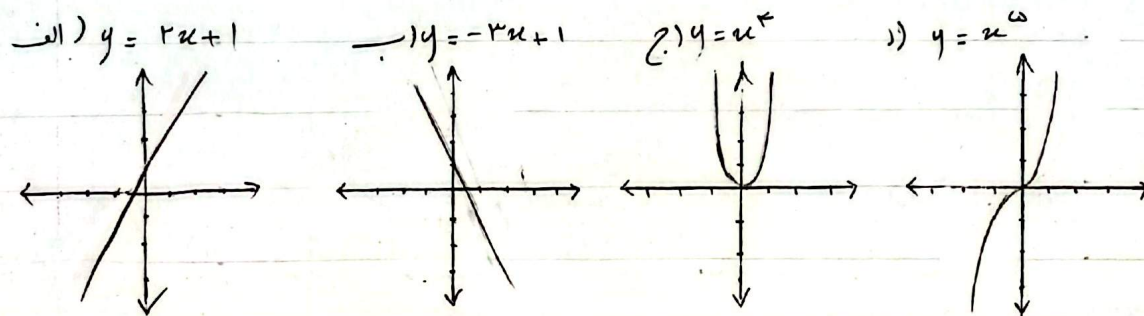


تابع است.  $y^3 - x = 2x^2 \rightarrow \begin{cases} y_1^3 - x_1 = 2x_1^2 \\ y_2^3 - x_2 = 2x_2^2 \end{cases} \xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \Rightarrow y_1 = y_2$   
 تابع نیست.  $|y| + x^2 = x + 3 \xrightarrow{x=0} |y| = 3 \rightarrow y = \pm 3$   
 تابع است درازای  $1/2$ .  $\sqrt{x-3} + |y-2| = 0 \rightarrow \sqrt{x-3} = 0 \Rightarrow x=3, |y-2|=0 \rightarrow y=2$   
 تابع نیست.  $x = \cos y \xrightarrow{x=0} \cos y = 0 \rightarrow y = \pi/2, 3\pi/2$



الف)  $y = ax + b \xrightarrow{\text{فانی}} ax + b = x \rightarrow a=1, b=0, a+2b=1+0=1$

ب)  $y = x^2 + ax + b \rightarrow \text{نقطهٔ اوج} x = -a/2 = 2 \rightarrow a = -4$   $y = -4/x \rightarrow \Delta = -4$   
 $a^2 - 4 \times 1 \times b = -4 \rightarrow 16 - 4b = -4 \rightarrow -4b = -20 \rightarrow b = 5, a+2b = -4+10=6$



الف)  $y = \frac{x+k}{x^2-kx} \rightarrow P_f = \mathbb{R} - \{0, k\}$

ب)  $y = \frac{x+k}{x^2-vx+14} \rightarrow \Delta = b^2-4ac = v^2-4 \cdot 14 = -14 \rightarrow$  (دائره محصور ندارد)  $\rightarrow P_f = \mathbb{R}$

ج)  $y = \frac{x+k}{x^2+x+k} \rightarrow \Delta = 1-4k = -14 \rightarrow$  (دائره محصور ندارد)  $\rightarrow P_f = \mathbb{R}$

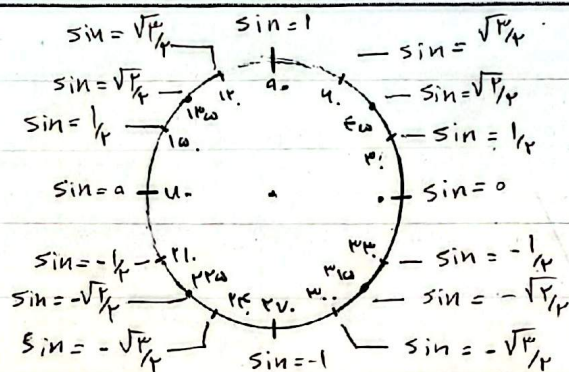
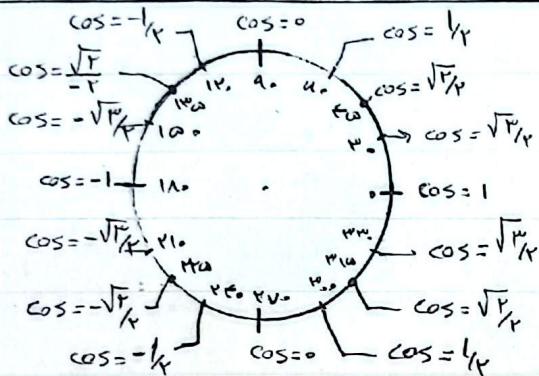
د)  $y = \frac{x+k}{x^2-kx^2} \Rightarrow P_f = \mathbb{R} - \{0, \pm k\}$   
 $\hookrightarrow x^2(x^2-k) \rightarrow x = 0, \pm k$

الف)  $y = \sqrt{4-x} + \sqrt{x-2} \rightarrow 4-x \geq 0 \rightarrow x \leq 4, x-2 \geq 0 \rightarrow x \geq 2 \Rightarrow P_f = [2, 4]$

ب)  $y = \frac{x+1}{x^2+1} \rightarrow P_f = \mathbb{R}$

ج)  $y = \frac{\sqrt{x-2}}{x-k} \rightarrow x-2 \geq 0 \rightarrow x \geq 2, x \neq k \rightarrow P_f = [2, k) \cup (k, +\infty)$

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



الف)  $-\cos 2\pi/4 = -(-1/2) = 1/2 = \sin \pi/4, \sin 3\pi/4$

ب)  $-\cos 11\pi/4 = -(\sqrt{3}/2) = -\sqrt{3}/2 \Rightarrow \sin 5\pi/4, \sin 3\pi/2$