

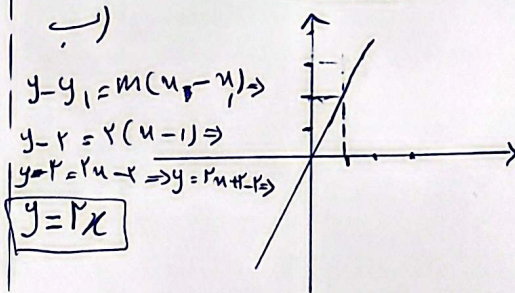
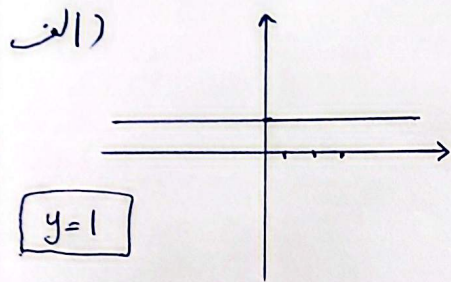
الف) $y_1^3 = 2x_1^2 + x_1$ $x_1 = x_2$ $y_1^3 = y_2^3 \Rightarrow y_1 = y_2 \rightarrow$ تابع است

$y_2^3 = 2x_2^2 + x_2$

ب) $|y| + x^2 = x + 3$ $x=0 \rightarrow |y| = 3 \Rightarrow y = \pm 3$ تابع نیست

ج) $\sqrt{x-4} + |y-2| = 0 \rightarrow$ چون دو عبارت جمع شده است پس هر دو صفر است $\sqrt{x-4} = 0 \Rightarrow x=4$ $|y-2| = 0 \Rightarrow y=2$ تابع است

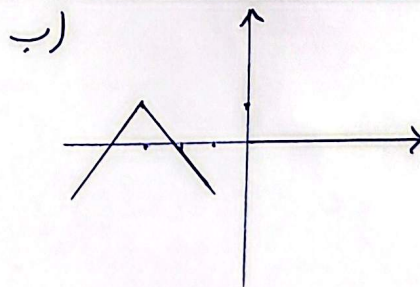
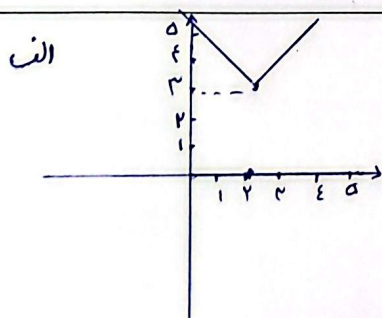
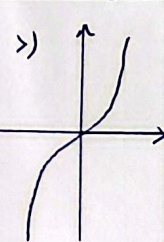
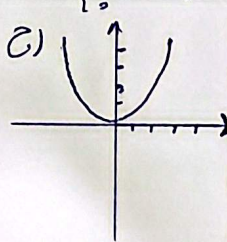
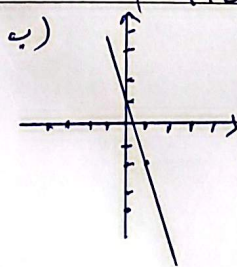
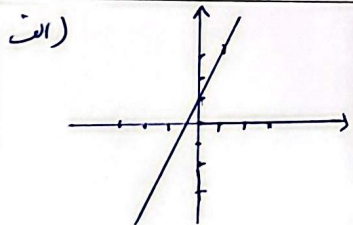
د) $x = \cos y \Rightarrow \cos y = 0 \Rightarrow y = \{ \frac{\pi}{2}, \frac{3\pi}{2} \mid k \in \mathbb{Z} \}$ تابع نیست



الف) $ax + b = x \Rightarrow a=1, b=0 \Rightarrow a+2b=1$

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

$\frac{-\Delta}{4a} = 1 \Rightarrow -\Delta = -4 \Rightarrow \Delta = a^2 - 4b = 4 \Rightarrow 4b = a^2 - 4$
 $a+2b = -4 + (4-1) = -1$



$$الف) y = \frac{x+2}{x^2-2x} \Rightarrow x^2-2x \neq 0 \Rightarrow x(x-2) \neq 0 \Rightarrow \begin{cases} x \neq 0 \\ x-2 \neq 0 \Rightarrow x \neq 2 \end{cases}$$

$$D = \mathbb{R} - \{0, 2\}$$

$$ب) \frac{x+2}{x^2-2x+1} \Rightarrow \Delta = b^2-4ac \Rightarrow \Delta = 4 - 4 \times 1 \times 1 = -12 \Rightarrow \text{ناقصه}$$

$$2.) \frac{x+2}{x^2+x+2} \Rightarrow \Delta = b^2-4ac \Rightarrow \Delta = 1 - 4 \times 1 \times 2 = -15 \Rightarrow \text{ناقصه}$$

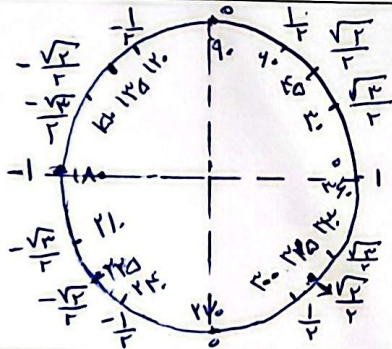
$$3.) \frac{x+2}{x^2-2x^2} \Rightarrow x^2-2x^2 \neq 0 \Rightarrow x^2(x-2) \neq 0 \Rightarrow \begin{cases} x \neq 0 \\ x-2 \neq 0 \Rightarrow x \neq 2 \end{cases}$$

$$الف) y = \sqrt{y-x} + \sqrt{x-2} \Rightarrow \sqrt{y-x} = 0 \Rightarrow x=y \Rightarrow \frac{y}{-1} + \frac{y}{1} \Rightarrow D = [2, 2]$$

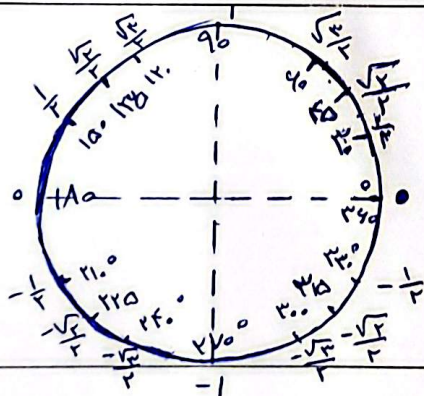
$$ب) y = \frac{x+1}{x^2+1} \Rightarrow D_f = \mathbb{R} \text{ (چون مخرج همیشه مثبت است پس در این مورد)}$$

$$2.) y = \frac{\sqrt{x-2}}{x-2} \Rightarrow \begin{cases} x-2 \geq 0 \Rightarrow x \geq 2 \\ x-2 \neq 0 \Rightarrow x \neq 2 \end{cases} \Rightarrow D_f = [2, +\infty) - \{2\}$$

$$3.) y = \frac{x+2}{x^2+x^2} \Rightarrow |x|+x^2 \neq 0 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$$



$\cos$



$\sin$

$$الف) \{2k\pi \pm \frac{\pi}{4} \mid k \in \mathbb{Z}\}$$

$$ب) \{2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \mid k \in \mathbb{Z}\}$$