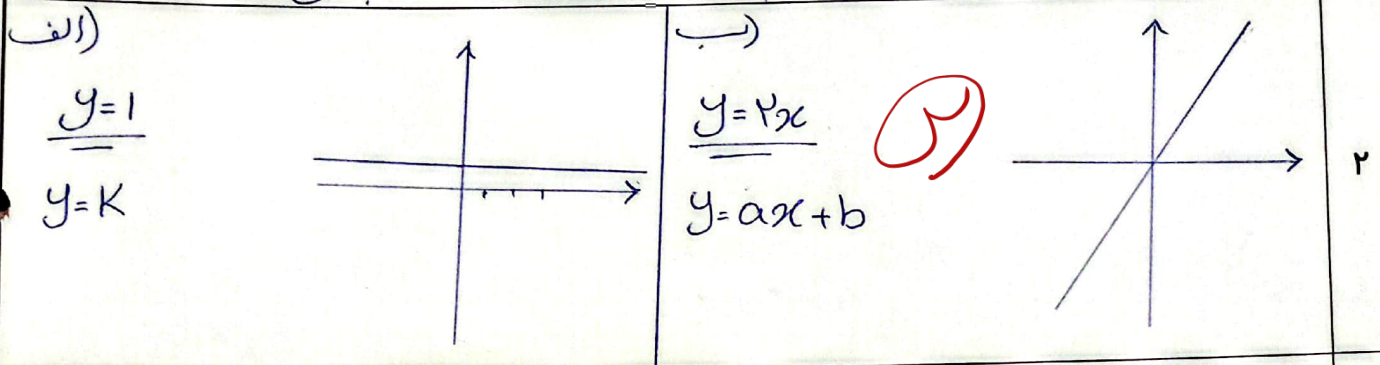


الف) $\begin{cases} y_1^3 - x_1 = 2x_1^2 \\ y_2^3 - x_2 = 2x_2^2 \end{cases}$ if $x_1 = x_2 \Rightarrow y_1^3 - x_1 - 2x_1^2 = y_2^3 - x_2 - 2x_2^2 \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2$
تابع هست.

ب) $|y| = -x^2 + x + 3$
 $\Rightarrow x = 0 \Rightarrow |y| = 3$
 $\Rightarrow y = 3, -3$ تابع نیست.

ج) $\sqrt{x-4} = 0$
 $x = 4$
 $|y-2| = 0$
 $y = 2$
یک نقطه $\begin{bmatrix} 4 \\ 2 \end{bmatrix}$ تابع هست.

د) $x = 0 \Rightarrow y = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ و $\begin{bmatrix} 0 \\ -1 \end{bmatrix}$
دو مقدار متفاوت تابع نیست.

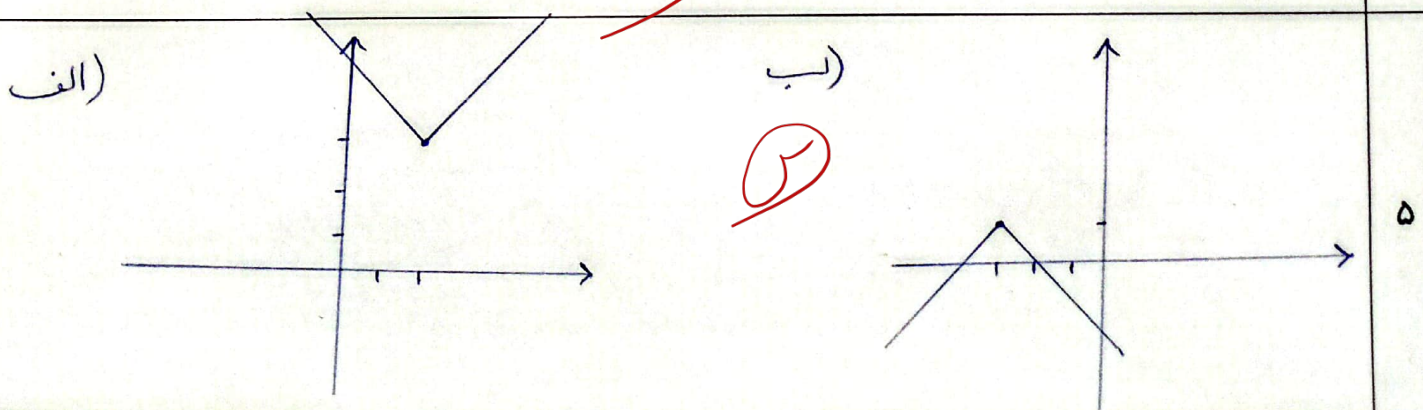
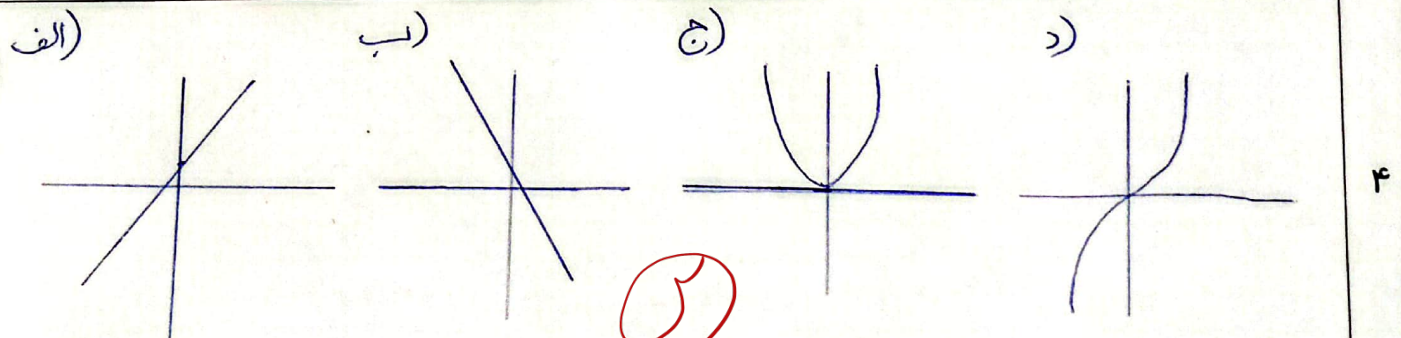


الف) $y = x \Rightarrow x = ax + b \Rightarrow a = 1, b = 0$ $a + 2b = 1$

ب) $\frac{-b}{2a} = 2 \rightarrow -b = 4a \rightarrow b = -4a$
 $\Rightarrow 1 = 4 + 2 - 4a \rightarrow 2a = 3 \rightarrow a = \frac{3}{2}$
 $\Rightarrow 1 = 4 + 3 + b \rightarrow b = -6$

د) $n_s = \frac{-b}{2a} = \frac{-a}{2} = 2 \rightarrow a = -4$
 $y_s = 1 \rightarrow 1 = (2)^2 - 4(2) + b$
 $b = -5$
 $a + 2b = -4 + 2(-5) = -14$

ج) $a + 2b = \frac{3}{2} - 12 = -10\frac{1}{2}$



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

ب) $x^2 - 7x + 14 \neq 0 \rightarrow \Delta = 49 - 4(1 \times 14) = \text{منفي} \Rightarrow D_f = \mathbb{R}$

ج) $x^2 + x + 4 \neq 0 \rightarrow \Delta = 1 - 4(1 \times 4) = \text{منفي} \Rightarrow D_f = \mathbb{R}$

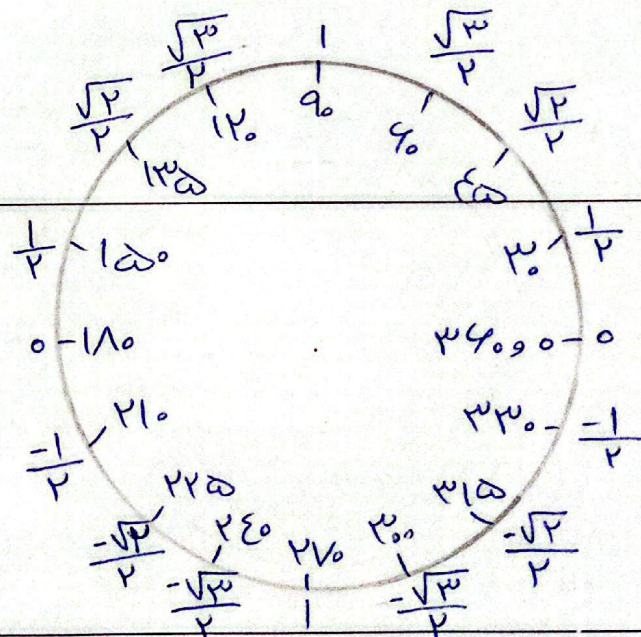
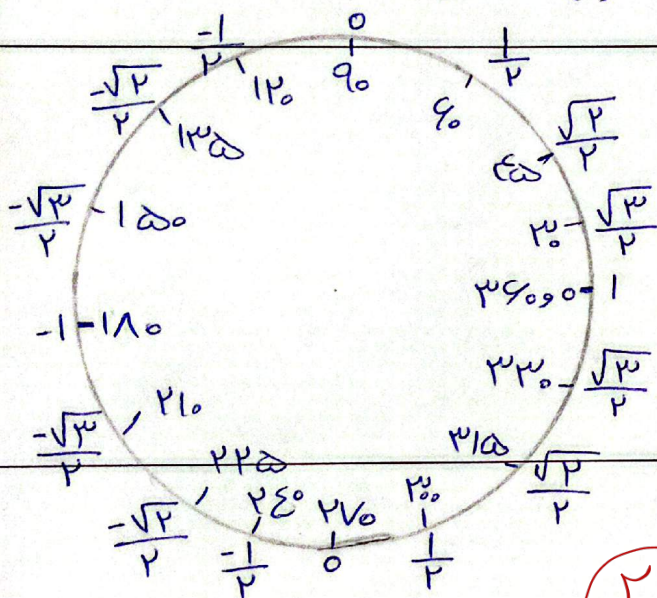
د) $x^2(x^2 - 4) = 0 \rightarrow x = 0, -2, 2 \Rightarrow D_f = \mathbb{R} - \{0, \pm 2\}$

الف) $4x \geq 0 \rightarrow 4 \geq x, x - 2 \geq 0 \rightarrow x \geq 2 \Rightarrow D_f = \{x \mid 4 \geq x \geq 2\}$

ب) $x^2 + 1 \rightarrow \text{دواره مثبت} \Rightarrow D_f = \mathbb{R}$

ج) $x - 2 \geq 0 \rightarrow x \geq 2, x - 4 \neq 0 \rightarrow x \neq 4 \Rightarrow D_f = \{x \mid x \geq 2 - \{4\}\}$

د) $|x| + x^2 \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$



الف) $\cos 120^\circ = -\frac{1}{2} \rightarrow \frac{1}{2} \rightarrow \sin 30^\circ, 150^\circ$

ب) $\cos 330^\circ = \frac{\sqrt{3}}{2} \rightarrow -\frac{\sqrt{3}}{2} \rightarrow \sin 240^\circ, 300^\circ$