

$$y^3 - x = 2x^2 \Rightarrow y^3 = 2x^2 + x \quad \text{الف)}$$

$$x=0 \Rightarrow y^3=0 \Rightarrow y=0$$

$$x=-1 \Rightarrow y^3=1 \Rightarrow y=1 \Rightarrow \text{تابع هست}$$

$$x=-2 \Rightarrow y^3=4 \Rightarrow y=\sqrt[3]{4}$$

$$|y| + x^2 = x + 3 \Rightarrow |y| = -x^2 + x + 3 \quad \text{ب)}$$

$$x=0 \Rightarrow |y|=3 \Rightarrow y=\pm 3 \Rightarrow \text{تابع نیست}$$

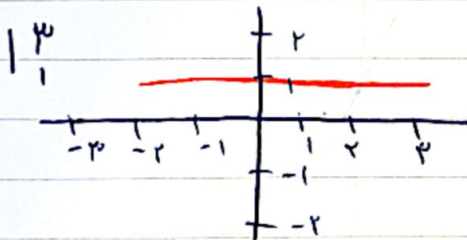
$$\sqrt{x-4} + |y-2| = 0 \Rightarrow -\sqrt{x-4} = |y-2| \Rightarrow \text{ج)}$$

$$x=1 \Rightarrow |y-2| = -2 \Rightarrow \text{تابع هست زیرا همیشه مقدار مطلق عددی مثبت و منفی نمی شود.}$$

$$x = \cos y \Rightarrow \text{تابع نیست}$$

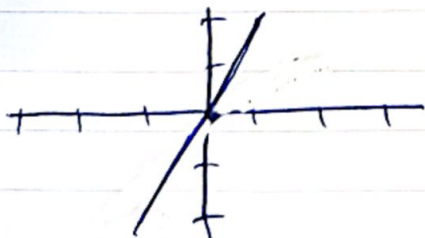
$$x=0 \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}$$

الف)



$$\Rightarrow y=1$$

$$\text{ب)} \quad y = ax + b \Rightarrow y = 2x + b \Rightarrow b=0 \Rightarrow y=2x$$



س

$$\text{ا) } y = ax + b \Rightarrow y = x \Rightarrow b = 0, a = 1$$

$$a + 2b = 1 + 2(0) = 1$$

$$\text{ب) } y = x^2 + ax + b$$

$$\text{Min} = \left| \frac{y}{1} \right| \Rightarrow y = \frac{a}{2(1)} \Rightarrow a = 2$$

$$\Rightarrow 1 = \frac{-\Delta}{2(1)} \Rightarrow -\Delta = 2 \Rightarrow \Delta = -2$$

$$a + 2b = 2 + 0 = 2$$

$$\Delta = a^2 - 4b = -2$$

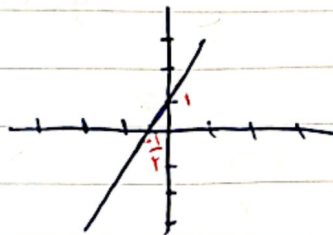
$$4 - 4b = -2 \Rightarrow -4b = -6 \Rightarrow b = \frac{3}{2}$$

$$b = \frac{3}{2}$$

$$\text{ا) } y = 2x + 1$$

$$y = 0 \Rightarrow x = -\frac{1}{2}$$

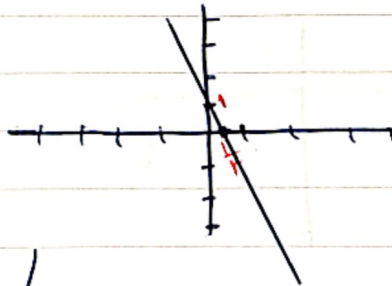
$$x = 0 \Rightarrow y = 1$$



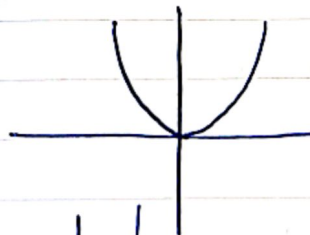
$$\text{ب) } y = -2x + 1$$

$$y = 0 \Rightarrow x = \frac{1}{2}$$

$$x = 0 \Rightarrow y = 1$$



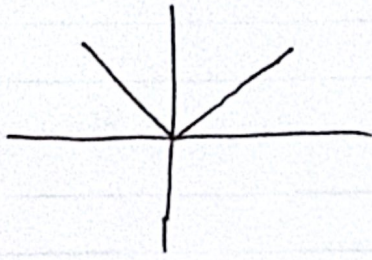
$$\text{ج) } y = x^2$$



$$\text{د) } y = x^3$$

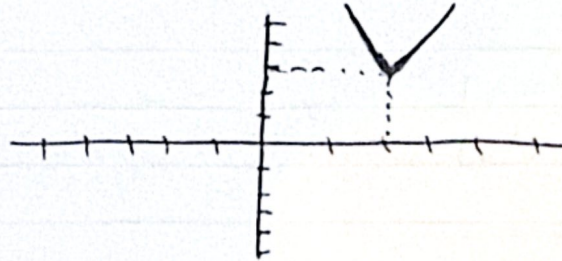


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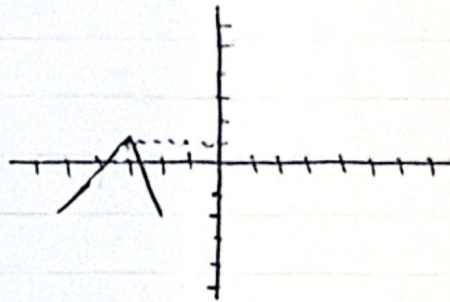


$$y = |x|$$

الف) $y = |x-2| + 3$



ب) $y = -|x+4| + 1$



الف) $y = \frac{x+4}{x^2-4x}$

$$x^2 - 4x \neq 0 \Rightarrow x^2 \neq 4x \Rightarrow x \neq 4, 0$$

$$D_f = \mathbb{R} - \{4, 0\}$$

ب) $y = \frac{x+4}{x^2-7x+14}$

$$x^2 - 7x + 14 \neq 0$$

$$\Delta = 49 - 56 = -7 < 0 \Rightarrow \text{دستور نیست در مخرج}$$

ج) $y = \frac{x+4}{x^2+x+4}$

$$x^2 + x + 4 \neq 0 \Rightarrow D_f = \mathbb{R}$$

$$\Delta = 1 - 16 = -15 < 0 \Rightarrow \text{دستور نیست در مخرج}$$

د) $y = \frac{x+4}{x^2-4x^2}$

$$x^2 - 4x^2 \neq 0 \Rightarrow x^2 \neq 4x^2 \Rightarrow x^2 \neq 4 \Rightarrow x \neq 2, -2, 0$$

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

$$\text{الف) } \sqrt{4-x} + \sqrt{x-2} =$$

$$4-x \geq 0 \Rightarrow x \leq 4 \quad x-2 \geq 0 \Rightarrow x \geq 2$$

$$2 \leq x \leq 4$$

$$D_f = [2, 4]$$

$$\text{ب) } y = \frac{x^2+1}{x^2+1} \Rightarrow x^2+1 \neq 0 \quad x^2 \neq -1 \Rightarrow \text{غير ممكن}$$

$$D_f = \mathbb{R}$$

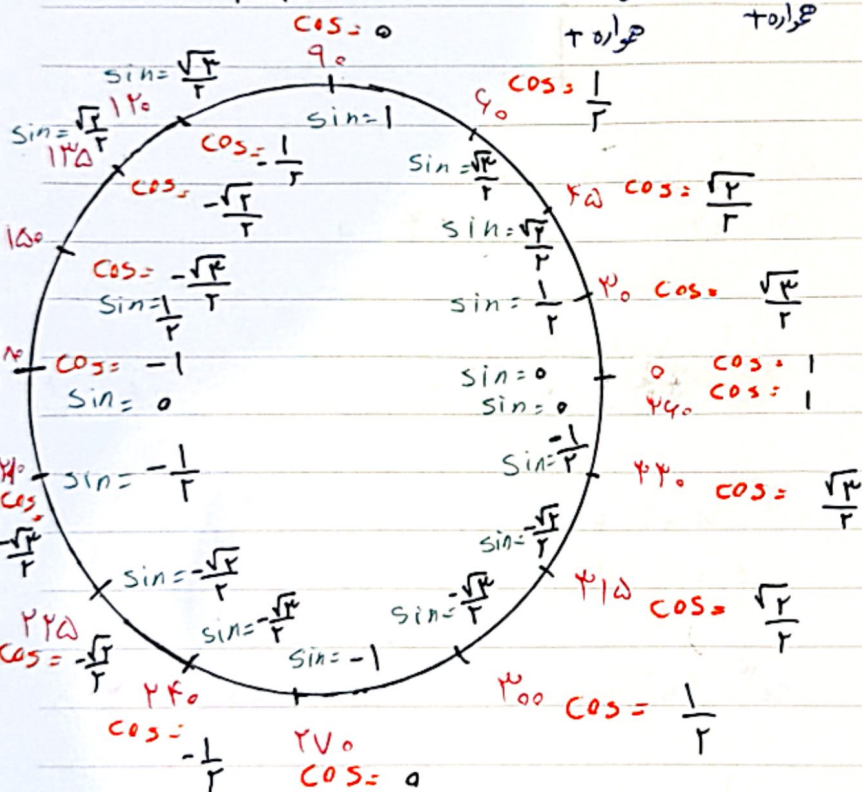
$$\text{ج) } y = \frac{\sqrt{x-2}}{x-2} \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2$$

$$x-2 \neq 0 \Rightarrow x \neq 2$$

$$D = [2, +\infty) - \{2\}$$

$$\text{د) } y = \frac{x^2+1}{\ln(x^2+1)} \Rightarrow \ln(x^2+1) \neq 0 \Rightarrow x^2+1 \neq 1 \Rightarrow x \neq 0$$

$$D_f = \mathbb{R} - \{0\}$$



$$\text{الف) } -(\cos 135^\circ) = \frac{1}{\sqrt{2}} \Rightarrow \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$$

$$\text{ب) } -(\cos 225^\circ) = -\frac{\sqrt{2}}{2} \Rightarrow \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$$