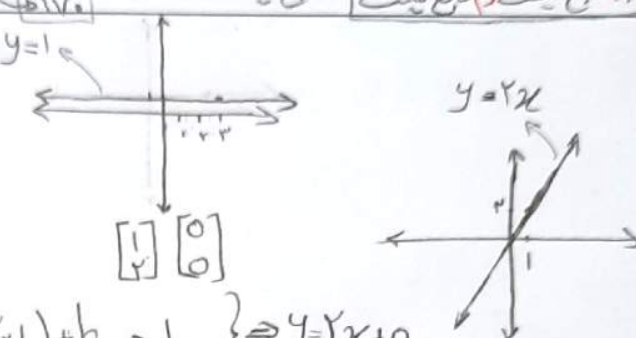


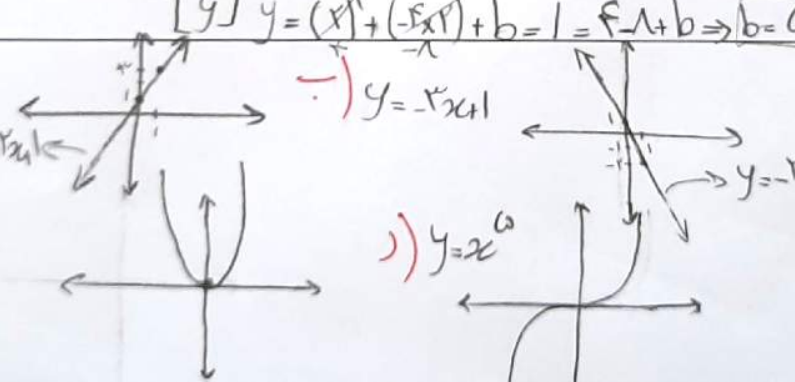
الف) $y''' - x = 2x^2 \rightarrow y''' = 2x^2 + x \rightarrow y'' = x(2x+1)$ برای هر x فقط یک مقدار y است $\Rightarrow$ تابع است
 ب) $|y| + x^2 = x + 2 \rightarrow |y| = x^2 + x + 2 \rightarrow |y| = x(x+1) + 2$ اگر $x=0$ $|y|=2 \Rightarrow y=2$ یا $y=-2$ $\Rightarrow$ تابع نیست
 ج) $\sqrt{x-4} + |y-2| = 0 \Rightarrow \sqrt{x-4} = 0, |y-2| = 0 \Rightarrow x=4, y=2$ تابع هست
 د) $x = \cos y$ if $x=0 \Rightarrow \cos y = 0 \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}$ تابع نیست

الف) $y = k$ تابع ثابت
 ب) $y = ax + b$ تابع خطی
 $\begin{bmatrix} 1 \\ 2 \end{bmatrix} a=2, y=2x+b \rightarrow 2 = (2 \times 1) + b \Rightarrow b=0 \Rightarrow y=2x+0$

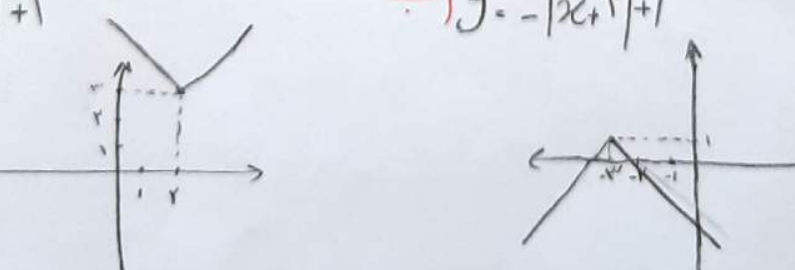


الف) $y = ax + b$ (الف) 1
 ب) $y = x^2 + ax + b$ (ب) 4
 $\Rightarrow a=1, b=0 \Rightarrow a+2b = 1 + (2 \times 0) = 1$
 $a+2b = \begin{cases} 1 \\ 4 \end{cases}$
 ب) $y = x^2 + ax + b$ میشود
 $\text{ctr} = \begin{bmatrix} x \\ y \end{bmatrix} \rightarrow -\frac{a}{2} = -2 \Rightarrow a = -4 \Rightarrow a+2b = -4 + (2 \times 5) = 6$
 $y = (x^2) + (-4x) + b = 1 = 4 - 4 + b \Rightarrow b = 5$

الف) $y = 2x + 1$ (الف) $y = 2x + 1$
 ب) $y = -3x + 1$ (ب) $y = -3x + 1$
 ج) $y = x^2$ (ج) $y = x^2$
 د) $y = x^3$ (د) $y = x^3$



الف) $y = |x-2| + 3$ (الف) $y = |x-2| + 3$
 ب) $y = -|x+3| + 1$ (ب) $y = -|x+3| + 1$



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

ب) $\frac{x+4}{x^2-4x+4} \rightarrow x^2-4x+4 \neq 0 \Rightarrow \Delta = (-4)^2 - 4(1)(4) = -16 \Rightarrow \text{صفر نشود} \Rightarrow D_f = \mathbb{R}$

ج) $\frac{x+4}{x^2+x+4} \rightarrow x^2+x+4 \neq 0 \Rightarrow \Delta = 1 - 4(1)(4) = -15 \Rightarrow \text{صفر نشود} \Rightarrow D_f = \mathbb{R}$

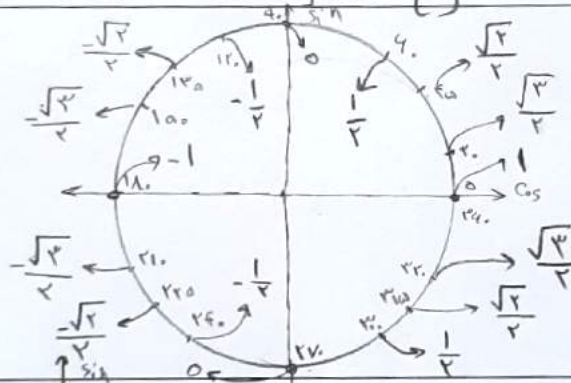
د) $\frac{x+4}{x^2-4x^2} \rightarrow x^2-4x^2 \neq 0 \Rightarrow x^2(x-4) \neq 0 \Rightarrow x \neq 0, 4 \Rightarrow D_f = \mathbb{R} - \{0, 4\}$

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

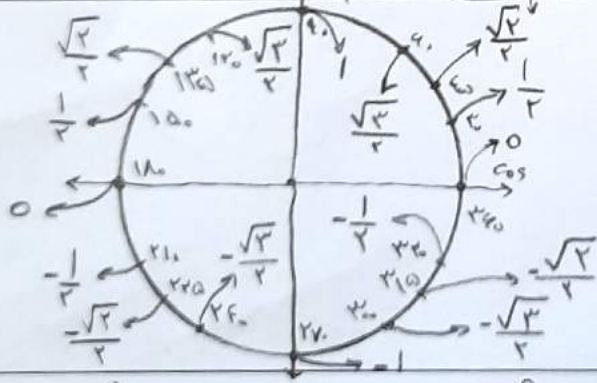
ب) $\frac{x^2+1}{x^2+1} \rightarrow x^2+1 \neq 0 \Rightarrow x^2+1 \neq 0 \Rightarrow D_f = \mathbb{R}$

ج) $\frac{\sqrt{x-2}}{x-4} \rightarrow x \geq 2, x \neq 4 \Rightarrow D_f = [2, 4) \cup (4, +\infty)$

د) $\frac{x^2+1}{|x|+x} \rightarrow |x|+x \neq 0 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$



: Cos



: Sin

الف) $-\left(\cos \frac{11\pi}{4}\right)$
 $\cos 135^\circ = -\frac{1}{\sqrt{2}} \rightarrow -\left(-\frac{1}{\sqrt{2}}\right) = \frac{1}{\sqrt{2}}$

$\sin \frac{1}{4} = \left\{2k\pi, \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4}\right\}$

ب) $-\left(\cos \frac{11\pi}{4}\right)$
 $\cos 315^\circ = \frac{\sqrt{2}}{2} \rightarrow -\frac{\sqrt{2}}{2}$

$\sin \frac{\sqrt{2}}{2} = \left\{2k\pi, \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4}\right\}$