

الف) $\begin{cases} y_1^3 = x_1 + 2x_1^2 \\ y_2^3 = x_2 + 2x_2^2 \end{cases} \xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \checkmark$ ب) $\begin{cases} |y_1| = -x_1^2 + x_1 + 3 \\ |y_2| = -x_2^2 + x_2 + 3 \end{cases} \xrightarrow{x_1 = x_2} y_1 = \pm y_2 \times$

ج) مثال نقض: $x=5 \rightarrow |y-2|=-1 \rightarrow y=1,3$

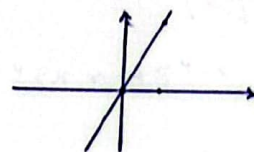
مثال نقض: $x=0 \rightarrow y=\pm 3$

د) مثال نقض: $x=1 \rightarrow y=0,3,4$

$f(x) = K \xrightarrow{[3]} f(x) = 1$



$f(x) = 2x + b \xrightarrow{[1]} 2 = 2 + b \rightarrow b = 0 \rightarrow f(x) = 2x$



$\begin{array}{c|c} x & 1 \ 0 \\ \hline y & 2 \ 0 \end{array}$

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

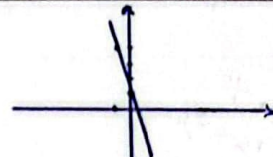
ب) $-\frac{a}{2} = 2 \quad 1 = 2 + \underbrace{(-2)}_{-a} \times 2 + b \rightarrow b=5 \rightarrow a+2b=9$

$a = -4$

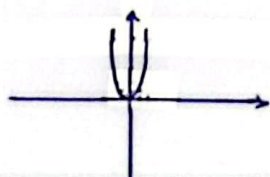
الف) $\begin{array}{c|c} x & 1 \ 0 \\ \hline y & 3 \ 1 \end{array}$



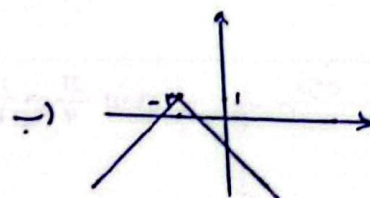
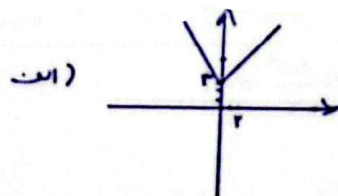
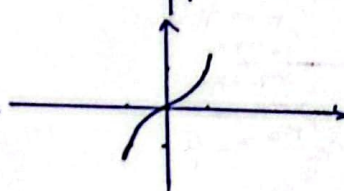
ب) $\begin{array}{c|c} x & 0 \ -1 \\ \hline y & 1 \ 4 \end{array}$



ج) $\begin{array}{c|c} x & 1 \ -1 \ 2 \\ \hline y & 1 \ 1 \ 14 \end{array}$



د) $\begin{array}{c|c} x & 1 \ -1 \ 0 \\ \hline y & 1 \ -1 \ 0 \end{array}$



ج) $x^2 - 2x = 0 \rightarrow x^2 = 2x \rightarrow x = 0, 2 \quad (x^2 - 4)x^2 = 0 \rightarrow x = 0, \pm 2$

الف) $D_f = \mathbb{R} - \{0, 2\}$ ب) $D_f = \mathbb{R} \quad (\Delta = -16)$

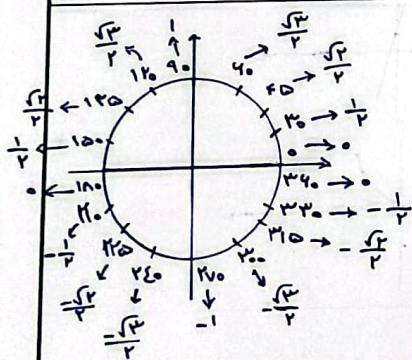
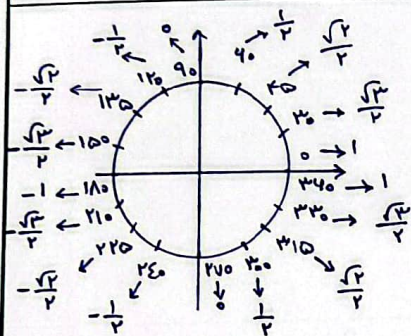
ج) $D_f = \mathbb{R} \quad (\Delta = -16)$ د) $D_f = \mathbb{R} - \{0, +2, -2\}$

الف) $4 - x \geq 0 \Rightarrow x \leq 4 \quad x - 2 \geq 0 \Rightarrow x \geq 2 \quad D_f = [2, 4]$

ب) $D_f = \mathbb{R}$ (مخرج هرجا صفر نشود)

ج) $x - 2 = 0 \rightarrow x = 2 \quad x - 2 \geq 0 \rightarrow x \geq 2 \quad D_f = [2, +\infty) - \{2\}$

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



الف) $\cos \frac{2\pi}{3} = -\frac{1}{2} \xrightarrow{\text{قرینه}} \frac{1}{2} \quad \sin \frac{\pi}{4} = \frac{1}{2}, \sin \frac{5\pi}{4} = -\frac{1}{2}$

ب) $\cos \frac{11\pi}{4} = \frac{\sqrt{2}}{2} \xrightarrow{\text{قرینه}} -\frac{\sqrt{2}}{2} \quad \sin \frac{5\pi}{3} = -\frac{\sqrt{3}}{2}, \sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}$