

$$\text{الف) } y^3 = 2x^2 - 1 \rightarrow \begin{cases} y_1^3 = 2x_1^2 - 1 \\ y_2^3 = 2x_2^2 - 1 \end{cases} \xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \rightarrow \boxed{y_1 = y_2}$$

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الف) $y = \frac{x^2}{2}$ $x = -2 \rightarrow y = 4 - 1 \rightarrow \boxed{y = 3}$ « مثال نقض » تابع هست ✓ همیشه مثبت

ب) $|y| + xy = x^2 + 1 \rightarrow |y| = 1 \rightarrow \boxed{y = \pm 1}$ « مثال نقض » تابع نیست ✗

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ج) $y^3 + x^3 = 2x - 1 \xrightarrow{x=0} y^3 = -1 \rightarrow \boxed{y = -1}$ « مثال نقض » تابع هست ✓ همیشه ۳ نقطه یک جواب دارد

د) $\sqrt[3]{y} + \sqrt[3]{x} = 2 \rightarrow \sqrt[3]{y} = 2 - \sqrt[3]{x} \xrightarrow{x=1} \sqrt[3]{y} = 2 - \sqrt[3]{1} = 1 \rightarrow \boxed{y = 1}$ « مثال نقض » تابع هست ✓

الف) $\tan \frac{\pi}{3} \Rightarrow \frac{\pi}{3} = \phi_0 \rightarrow \tan(\phi_0) \rightarrow \frac{\sin \phi_0}{\cos \phi_0} = \sqrt{3}$

ب) $\cot \frac{\sqrt{3}\pi}{4} \Rightarrow \frac{\sqrt{3}\pi}{4} = \phi_0 \Rightarrow \tan \phi_0 \rightarrow \tan 30^\circ \rightarrow \frac{\sin 30^\circ}{\cos 30^\circ} = \frac{1}{\sqrt{3}}$

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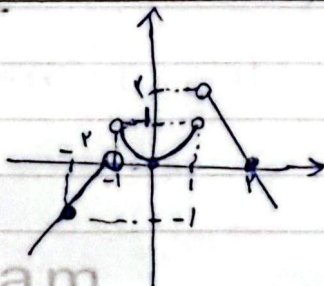
ج) $\tan 330^\circ \rightarrow -\tan 30^\circ = -\frac{\sin 30^\circ}{\cos 30^\circ} \rightarrow -\frac{1}{\sqrt{3}}$

د) $\cot 110^\circ \rightarrow \frac{\cos 110^\circ}{\sin 110^\circ} = \frac{-1}{\sqrt{3}}$ تعریف نشده

الف) $\sin \alpha = \frac{1}{\sqrt{2}} \rightarrow \alpha = \frac{\pi}{4}, \frac{3\pi}{4}$

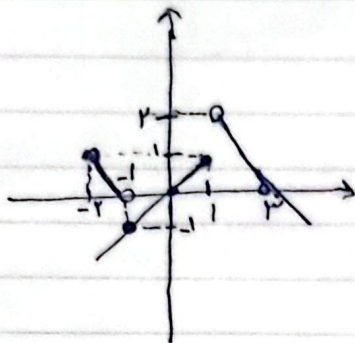
ب) $\cos \alpha = -\frac{\sqrt{2}}{2} \rightarrow \alpha = \frac{3\pi}{4}, \frac{5\pi}{4}$

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$x = 1$	
$x = 2$	$x > 1$
$x = 1$	
$x = 0$	$-1 < x < 1$
$x = -1$	
$x = -1$	$x < -1$

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$$x > 1$$

$$x = 1$$

$$x > 1$$

$$x = 1$$

$$x > 0$$

$$-1 < x < 1$$

$$x = -1$$

$$x = -1$$

$$x < -1$$

الف) $(x-1)(x-2)(x-3)$

$$\frac{1}{-b} + \frac{1}{b} - \frac{1}{b} + \frac{1}{b} \quad D_f = [1, 2] \cup [3, +\infty)$$

ب) $(x-1)(x-2)^*(x-3)$

$$\frac{1}{+b} - \frac{1}{b} - \frac{1}{b} + \frac{1}{b}$$

$$D_f = [1, -\infty) \cup [3, +\infty)$$

الف) $\frac{(x-1)(x-3)}{(x-2)^2}$

$$\rightarrow \frac{1}{-b} + \frac{1}{b} - \frac{1}{b} + \frac{1}{b} \quad D_f = [1, 2] \cup [3, +\infty)$$

ب) $\frac{(x-1)(x-3)}{(x-2)^2}$

$$\rightarrow \frac{1}{+b} - \frac{1}{b} - \frac{1}{b} + \frac{1}{b}$$

$$D_f = [1, -\infty) \cup [3, +\infty)$$

الف) $\frac{x^2-3x+2}{x-2} = \frac{(x-1)(x-2)}{(x-2)}$

$$\rightarrow \frac{-1}{+b} - \frac{1}{b} - \frac{1}{b} + \frac{1}{b} \quad D_f = [-1, -\infty) \cup (2, +\infty)$$

ب) $\frac{x^2-3x+2}{x^2-5x+6} = \frac{(x-2)(x-1)}{(x-2)(x-3)}$

$$\rightarrow \frac{1}{+b} + \frac{1}{b} - \frac{1}{b} + \frac{1}{b}$$

$$D_f = (-\infty, 1) \cup (2, 3) \cup (3, +\infty)$$

الف) $\frac{x^2-x}{x^2+x+2} = \frac{x(x-1)}{x^2+x+2} = \frac{x(x-1)(x+1)}{x^2+x+2}$

$$\rightarrow \frac{-1}{-b} + \frac{1}{b} - \frac{1}{b} + \frac{1}{b} \quad D_f = [-1, 0] \cup [1, +\infty)$$

ب) $\frac{x^2+3x+2}{x^2+2x+3}$

$$\Rightarrow D_f = \mathbb{R}$$

s.a.m