

الف: $y^3 = 2x^2 - 2x + 1 \rightarrow y = \sqrt[3]{2x^2 - 2x + 1} \rightarrow$ تابع است

ب: $y = x \cdot \frac{\cos y}{\cos x} \rightarrow \frac{y}{\cos y} = \frac{x}{\cos x} \xrightarrow{\text{تعریف رابنوی}} \frac{x \cos y_1}{x} = \frac{x \cos y_2}{x} \Rightarrow (\cos y)_1 = (\cos y)_2$ تابع نیست

ج: $\frac{x-y}{y} = \sqrt{xy} \rightarrow y = \sqrt{\frac{x-y}{y}} \cdot y = \sqrt{x-y} \cdot \sqrt{y} = \sqrt{xy} - x \Rightarrow \sqrt{x} = \sqrt{y}$ تابع است

د: $y + 2y - x^2 = 2x + x^2 \Rightarrow x(2+y^2) = y(2+y^2) \xrightarrow{y \neq x} \frac{y(2+y^2)}{2+y^2} = x$ تابع است

الف: $y = \frac{x^2 - |y|}{y} \rightarrow \frac{x^2 - y}{y} = \frac{x^2}{y} - 1 \Rightarrow \frac{x^2}{y} = 1 \Rightarrow y = x^2$ تابع است

ب: $y \geq 0 \Rightarrow \frac{x^2}{y} = 1 \Rightarrow x^2 = y \Rightarrow x = \pm \sqrt{y}$ تابع نیست

ج: $y \leq 0 \Rightarrow \frac{x^2}{y} = 1 \Rightarrow x^2 = y \Rightarrow y = x^2$ تابع نیست

د: $y = 1$ و $x = -1$ تابع نیست

$\begin{cases} 2x^2 - b & |x-1| \geq 1 \\ a + 2x & 0 \leq x \leq 3 \end{cases} \Rightarrow \begin{cases} x \geq 1 \\ x \leq -1 \end{cases} \Rightarrow \begin{cases} x=3 \\ x=0 \end{cases}$

$2x^2 - b = a + 2x \xrightarrow{x=3} 18 - b = a + 6 \Rightarrow 18 - 6 = a + b = 12$

$a=b \rightarrow 0 \Rightarrow a - ab - b^2 = 0 \Rightarrow a = 0$

$a \neq 0 \rightarrow 0 \Rightarrow a - ab - a^2 = 0 \Rightarrow a(1-b-a) = 0$

$a \neq b \rightarrow 1$

$\Rightarrow \boxed{a, b = 1}$

$S = -\frac{b}{a} = -1$

$P = \frac{c}{a} = -1$

$\Rightarrow \boxed{a=2} \rightarrow a \times b = -a \Rightarrow \boxed{b=-1}$

$(-\infty, 2) \rightarrow$ کران باز $\Rightarrow a=0$ و $b < 0$

$2b + c = 0 \Rightarrow c = -2b$

$\Rightarrow \frac{3}{2}a + c - 3|b| = c + 3b \Rightarrow \boxed{c = -2b}$

