

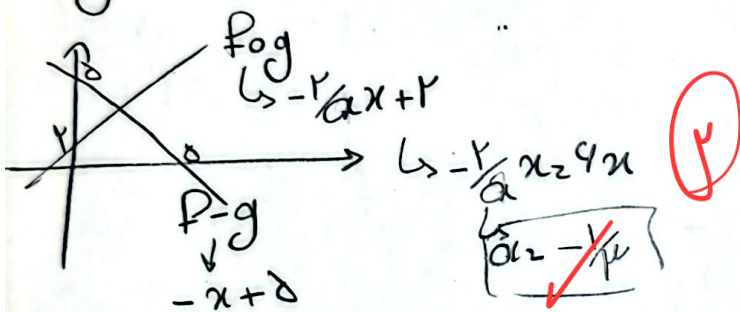
$$\begin{aligned} f(x) &= 2x - 1 \rightarrow f(g(x)) = 2g(x) - 1 \\ &\rightarrow 2g(x) - 1 = 2x - 1 \\ &\rightarrow 2g(x) = 2x \rightarrow g(x) = x \end{aligned}$$

$$g(f(x)) = (2x - 1) + 1 = 2x$$

$$\begin{aligned} f(x) - g(x) &= x + \delta \\ &\rightarrow f(x) - g(x) = x + \delta \\ &\rightarrow f(x) - g(x) = 1 \end{aligned}$$

$$g(x) = x - 1, f(x) = x + 1$$

$$f(g(x)) = 2(x - 1) + 1 = 2x - 1$$



$$f(g(x)) = 2x - 1 \rightarrow x - 1 = x - 1$$

$$\begin{aligned} g(f(x)) &= 2x \\ &\rightarrow 2x = 2x \\ &\Rightarrow [0, 1] \end{aligned}$$

$$f\left(\frac{x-1}{2}\right) = \frac{x-1}{2} + 1 = \frac{x+1}{2}$$

$$(x - \frac{1}{2}) - \frac{1}{2} + 1 \rightarrow x - 1 + 1$$

$$\Rightarrow f(x) = x + 1$$

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$$\begin{aligned} f(x) &= \sqrt{x-1} \\ g(x) &= \sqrt{-(x-1)^2} \end{aligned}$$

$$-(\sqrt{x-1})^2 \geq 0 \rightarrow -(\sqrt{x-1})^2 \geq 0$$

$$\Rightarrow \sqrt{x-1} \geq 1 \rightarrow x-1 \geq 1 \rightarrow x \geq 2$$

$$Dg \circ f(x) = \frac{1}{2\sqrt{x-1}}$$

$$f(g(x)) = f(x-1) = \sqrt{x-1} - 1$$

$$g(f(x)) = g(x-1) = \sqrt{-(x-1)^2} = 1 - x$$

$$g(f(x)) = f(g(x)) \Rightarrow 1 - x = \sqrt{x-1} - 1$$

$$\begin{aligned} x^2 + 1 &\rightarrow x^2 - 1 \\ &\rightarrow x^2 - 1 = 0 \end{aligned}$$

$$\begin{aligned} g(f(x)) &= g(x) = \frac{1}{x} + 1 \\ &\rightarrow \frac{1}{x} + 1 = \frac{1}{x} + 1 \end{aligned}$$

$$g(x-1) = \frac{1}{x-1} + 1 \rightarrow \frac{1}{x-1} + 1 = \frac{1}{x-1} + 1$$

$$\begin{aligned} &\rightarrow \frac{1}{x-1} + 1 = \frac{1}{x-1} + 1 \\ &\rightarrow \frac{1}{x-1} + 1 = \frac{1}{x-1} + 1 \end{aligned}$$

$$f(x) = f(1-x) \cdot e^{\frac{1}{x-x^2}} \quad -1$$

$$1-x^2 > 0 \rightarrow \frac{1}{1+x^2} \rightarrow Df = (0, 1)$$

$$\text{exb} \left\{ \frac{1}{14} \rightarrow e^{\frac{1}{14}} \approx 1.07 \Rightarrow P_{f(x)}(-\infty, 1] \right\}$$

$$\Rightarrow D \cap P = (0, 1] \quad \boxed{1, 1, 1}$$

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$$h(x) = x^k + kx + 1$$

$$g(x) = x - 1$$

$$f \circ h(x) = 1 - (h(x))^2 \rightarrow 1 - (x^k + kx + 1)^2$$

$$x^k - kx^k + 2x - 1 = 1 - (x^k + kx + 1)^2 \rightarrow x^k + 2x - kx^k = 0$$

توابع درجه ۳ مثل تابع بالا
را قطع می کند یک ریشه داریم! (7)

$$g \circ f(x) = x^k + kx \rightarrow g(x - \frac{x}{k}) = x^k + kx - 1$$

$$x - \frac{x}{k} = \frac{kx - x}{k} \rightarrow x = 1$$

$$x = 1 \rightarrow g(x) = -1 - 1 = -2 \rightarrow \alpha_2 = -1$$

$$x = 0 \rightarrow g(x) = 0 + 1 = 1 \rightarrow \alpha_2 = 0$$

$$\boxed{\alpha_2 = -1, 0}$$

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