

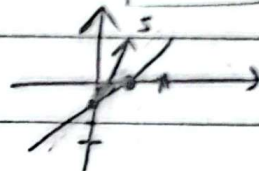
کتاب دینی / (دراسة) اجماع A

در کتاب

کتاب دینی

$$2y = 3x - 1 \quad \text{مکملی} \quad 2y - 1 = 3x \rightarrow 2y - 1 = x \quad \frac{\text{مقدار } x \text{ و } y}{\text{مقدار } x} \quad \left[\frac{2x-1}{3} \right] \quad (1)$$

$$\rightarrow \frac{2}{3}x - \frac{1}{3} = y \quad \text{مکملی} \quad y = 0 \rightarrow x = \frac{1}{2} \quad \left. \begin{array}{l} x = 0 \rightarrow y = -\frac{1}{2} \end{array} \right\} \Rightarrow$$

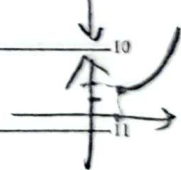


$$S = \frac{\text{ارتفاع} \times \text{قاعدہ}}{2} = \frac{1}{2} \times \left| -\frac{1}{2} \right| = \frac{1}{4}$$

(2) در تابع درجه ۲ در معادله وارون نیز باید یک ضریب از $\frac{1}{a}$ را در نظر بگیریم تا به جواب برسیم!

$$y = x^2 - 2x + 3 \quad x \in [1, +\infty) \rightarrow -\frac{b}{2a} = \frac{+2}{2} = 1 \quad \text{کتابخانه است!}$$

$$y = (x^2 - 2x + 1) + 2 = (x-1)^2 + 2 \rightarrow \sqrt{y-2} + 1 = x$$



$$Rf = Df^{-1} \Rightarrow Df^{-1} = [2, +\infty)$$

$$y = x^2 - 2x + 3 \quad x \in [2, +\infty) \rightarrow -\frac{b}{2a} = 1 \rightarrow$$



$$\text{مکملی} \Rightarrow y = \sqrt{x-2} + 1$$

$$Df^{-1} = Rf \rightarrow Df = [2, +\infty)$$



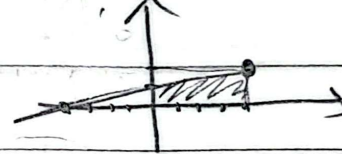
$$y = 2x - \sqrt{4 - 4x + 4x^2} = 2x - \sqrt{(2x - 1)^2} = 2x - |2x - 1| \quad (1)$$

$$\Rightarrow \begin{cases} 2x - 2x + 1 = 1 & : x \geq \frac{1}{2} \\ 2x + 2x - 1 = 4x - 1 & : x < \frac{1}{2} \end{cases} \rightarrow y = 4x - 1 \rightarrow x = \frac{y+1}{4} \rightarrow y = \frac{x+1}{2}$$

$D_f^{-1} = (-\infty, \infty]$ $D_f = (-\infty, 2]$ در صورتی تابع وارون پذیر است

مثلاً: $y = \frac{x+1}{2} \Rightarrow x = 2y - 1 \quad x \leq 2$

$S = \frac{(1+2) \times 2}{2} = 3$



$$y = \frac{x}{\sqrt{x^2 - a}} \quad y_1 = \frac{x_1}{\sqrt{x_1^2 - a}} \quad y_2 = \frac{x_2}{\sqrt{x_2^2 - a}} \rightarrow \frac{y_1}{y_2} = \frac{x_1}{x_2} \quad (2)$$

$$\Rightarrow \frac{y_1}{y_2} = \frac{x_1}{x_2} \rightarrow y_1 x_2 = y_2 x_1 \rightarrow \frac{x_1}{\sqrt{x_1^2 - a}} x_2 = \frac{x_2}{\sqrt{x_2^2 - a}} x_1 \rightarrow \sqrt{x_1^2 - a} = \sqrt{x_2^2 - a} \rightarrow x_1^2 = x_2^2$$

$$\Rightarrow x_1 = \pm x_2 \rightarrow \boxed{x_1 = x_2}$$

در نتیجه تابع یک به یک و وارون پذیر است

$$y = \frac{x}{\sqrt{x^2 - a}} \Rightarrow y^2 = \frac{x^2}{x^2 - a} \rightarrow y^2 x^2 - a y^2 = x^2 \rightarrow y^2 x^2 - x^2 = a y^2$$

$$\Rightarrow x^2 = \frac{a y^2}{y^2 - 1} \rightarrow x = \pm \sqrt{\frac{a y^2}{y^2 - 1}} \quad \text{مثلاً: } y = \pm \sqrt{\frac{a x^2}{x^2 - 1}} \rightarrow ?$$

$$y = \sqrt{x} + |x| \quad \begin{cases} \exists x : x \geq 0 \quad \underline{\text{sub}}, y = \sqrt{x} \rightarrow x = \frac{1}{x} : x \geq 0 \\ \forall x : x \leq 0 \quad \underline{\text{sub}}, y = \sqrt{x} \rightarrow x = \frac{y}{x} : x \leq 0 \end{cases}$$

$$\Rightarrow f^{-1}(x) = \begin{cases} \frac{x}{2} : x \geq 0 \\ \frac{x}{x} : x \leq 0 \end{cases} \rightarrow ax + b|x| \quad \begin{cases} (a+b)x : x \geq 0 \\ (a-b)x : x \leq 0 \end{cases}$$

$$\begin{cases} a+b = \frac{1}{x} \\ a-b = \frac{1}{x} \end{cases} \Rightarrow \forall a = \frac{1}{x}, a = \frac{1}{x}, b = -\frac{1}{x}$$

$$\Rightarrow ax + b = \frac{1}{x}x - \frac{1}{x} = -\frac{1}{x}$$



Genobar

$$y = \frac{2x+5}{x+3} \xrightarrow{(10-1)} \frac{4+5}{2+3} = -1 \rightarrow f+m = -1 \rightarrow m = -2 \quad (\checkmark)$$

$$\Rightarrow y = \frac{2x+5}{x-2} \Rightarrow \text{در } x = -2 \text{، تابع تعریف نشده است:}$$

$$f^{-1}(x) = \frac{2x+5}{x-2} \rightarrow y = f \circ f^{-1}(x) + f^{-1}(x) = x + \frac{2x+5}{x-2}$$

$$\rightarrow y = \frac{x^2+5}{x-2} \xrightarrow{y=x} \frac{x^2+5}{x-2} = x \rightarrow x^2+5 = x^2-2x$$

$$\rightarrow 5 = -2x \rightarrow x = -\frac{5}{2} \rightarrow ?$$

$$f(2-2x) = 2 - g\left(\frac{x}{2}\right) \rightarrow \varepsilon g^{-1}(\varepsilon) + f^{-1}(-2) = ? \quad (\wedge)$$

$$\hookrightarrow -2 = 2 - g\left(\frac{x}{2}\right) \checkmark \quad \Rightarrow \begin{cases} f(2-2x) = -2 \\ g\left(\frac{x}{2}\right) = \varepsilon \end{cases}$$

$$\Rightarrow \varepsilon\left(\frac{x}{2}\right) + 2-2x = 2x+5-2x = 5 \rightarrow ?$$

دو تابع نسبت به مبدأ قرینه کنند (۱) جای اولی عوض می شود (۲) اولی قرینه می شود (۳)

$$y = \frac{5x-15}{1-x} \xrightarrow{\text{قرینه نسبت به مبدأ}} -x = \frac{-5x-15}{1+x} \rightarrow x = \frac{5x+15}{1+x}$$

$$\Rightarrow y = \frac{-x+15}{1-5x} \xrightarrow{\text{آواسه بدست}} y = \frac{-(x-2)+15}{1-5(x-2)} = \frac{-x+17}{-5x+9}$$

$$\text{آواسه بدست} \rightarrow y = \frac{x-15}{5x+9} - 5 = \frac{x-15-5(5x+9)}{5x+9} = \frac{-24x-54}{5x+9}$$

$$f^{-1} = \frac{-24x-54}{5x+9} \rightarrow f^{-1} = f \rightarrow \frac{-9x+57}{5x+9} = \frac{-24x-54}{5x+9}$$

$$\rightarrow -9x+57 = -24x-54 \rightarrow 15x = -111 \rightarrow x = -\frac{111}{15} = -\frac{37}{5}$$

$$\rightarrow -24x-54 = -111 \rightarrow x = -\frac{111-54}{24} = -\frac{57}{24} = -\frac{19}{8}$$

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$$\textcircled{I} y = x + \varepsilon[x] \xrightarrow[\text{طرفین میں}]{\text{ایک طرف میں}} x = y + \varepsilon[y] \quad (6)$$

$$\textcircled{II} [y] = [x + \varepsilon[x]] \rightarrow [y] = \omega[x] \rightarrow [x] = \frac{[y]}{\omega}$$

$$\text{جس طرف میں طرفین میں} \quad [y] = \frac{[x]}{\omega}$$

$$\begin{aligned} & \Rightarrow \left\{ \begin{array}{l} [y] = \frac{[x]}{\omega} \\ x = y + \varepsilon[y] \end{array} \right\} \Rightarrow x - \varepsilon[y] = y \rightarrow \boxed{x - \frac{\varepsilon[x]}{\omega} = y} \end{aligned}$$

$$\Rightarrow g(x) = x - \frac{\varepsilon}{\omega}[x] \quad , \quad f(x) = x + \varepsilon[x]$$

$$\textcircled{8} (f-g)(x) = x + \varepsilon[x] - x + \frac{\varepsilon}{\omega}[x] = \left(\frac{2\varepsilon}{\omega} [x] \right) \rightarrow 2$$