

۲. آخرین عملی نوشته شده

کتاب انوری

الف) $\sqrt{\frac{x^2 - 1}{x(x-1)}} = \sqrt{\frac{-1}{x(x-1)}} + \frac{0}{1} + \frac{1}{1}$ $D_f = (-\infty, 0) \cup [\frac{1}{2}, 1)$

ب) $\frac{x^2 - 1}{(x+1)x} \rightarrow x \neq 0, -1, 1, -2$ $D_f = \mathbb{R} - \{\pm 1, -2, -\frac{1}{2}\}$

الف) $(\frac{1}{x})^2 - 9 \geq 0$ $x = -2 \rightarrow \frac{1}{4} - 9 \geq 0$ $D_f = (-\infty, -2] \cup [\frac{1}{3}, +\infty)$

ب) $\sqrt{x-1} + \sqrt{y+1} = 2$ I) $x \geq 1$

II) $\sqrt{x-1} \leq 2$ $x-1 \leq 4$ $x \leq 5$ $D_f = [1, 5]$

I) $x^2 - x - 2 > 0$ $(x-2)(x+1) > 0$ $x > 2 \cup x < -1$

II) $x^2 - 1 > 0$ $(x-1)(x+1) > 0$ $x > 1 \cup x < -1$

III) $\sqrt{x^2 - 1} + 1 > 0$ $x \geq 1 \cup x < -1$

$I \cap II \cap III \Rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$

$x = -2 \rightarrow \sqrt{1 + ax - x^2} \rightarrow 1 - 2a - 2 = 0 \rightarrow a = -\frac{1}{2}$

$x^2 - \frac{1}{2}a + 1 = 0$

$\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{1}{2} \pm \sqrt{\frac{1}{4} + 1}$

$a + b = \frac{1}{2} - \frac{1}{2}$

I) $x \geq 1 \rightarrow \sqrt{1 + ax - x^2} = \sqrt{1 - x^2} \rightarrow 1 - x^2 \geq 0 \rightarrow x \leq 1$

II) $x < 1 \rightarrow \sqrt{1 + ax - x^2} = \sqrt{1 - x^2} \rightarrow x + 1 \geq 0 \rightarrow x \geq -1$

$I \cup II \Rightarrow [-1, 1]$

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

$$f(\sin \theta + \cos \theta) = f\left(\frac{\sqrt{1}}{1} + 1\right)$$

$$\sqrt{\left(\frac{\sqrt{1}}{1} + 1\right)^2 - 1} = \sqrt{\left(\frac{1}{1} + 1 + \sqrt{1}\right) - 1} = \frac{1}{1} + 1 + \sqrt{1} - 1 = \frac{1}{1}$$

$$f(a) = \frac{a+1}{a-1}$$

$$f(f(a)) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{a(a-1)}{a-1} = a$$

$$\text{if } a \neq 1 \rightarrow D_f = \mathbb{R} - \{1\}$$

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

$$f(g(a)) = \left(\sqrt{a^2 - 1}\right)^2 - 1 = a^2 - 1 - 1 = a^2 - 2$$

$$a^2 - 2 = 0 \rightarrow (a-1)^2 = 0 \rightarrow a-1 = 0 \rightarrow a = 1$$

$$f(x) = 1 - \omega + y = 1$$

$$f(-1) = 1 + y + y = 1 + 2y$$

$$x + y = 1 \rightarrow x = 1$$

$$x + y = 1 \rightarrow x = -1 \rightarrow \sqrt{1} = 1$$

$$\sqrt{\cos^2 x + \omega \cos x} = \sqrt{1}$$

$$\sqrt{\cos^2 x + \omega \cos x} = \sqrt{1} \Rightarrow \cos^2 x + \omega \cos x - 1 = 0$$

$$\cos^2 x + \omega \cos x - 1 = 0$$

$$(\cos x + 1)(\cos x - 1) = 0$$

$$\cos x = \frac{1}{2}$$

$$\cos x = \frac{1}{2}$$

$$\rightarrow \tan x = \sqrt{1} \rightarrow \tan x = 1 \rightarrow f(x, \omega) = 1$$