

۲. آفرین محلی نوشتن

$\sin \frac{\pi}{6} = \frac{\sqrt{3}}{2}$ $\cos \frac{\pi}{6} = \frac{1}{2}$
 $-\frac{\pi}{6} = -\frac{\pi}{6}$
 $\frac{\sqrt{3}}{2} + 1$

$(\frac{\sqrt{3}}{2} + 1)^2 = \frac{3}{4} + 1 + \sqrt{3}$
 $\frac{3}{4} + 2 + \sqrt{3}$

⑥

$2x^2 - 4x = \frac{3}{4} + 2 + \sqrt{3} - 4\sqrt{3} - 4 = -\frac{1}{4}$

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

$D_f = \mathbb{R} - \{1\}$

برای هر عددی امکان پذیره!

$g(a) = \sqrt{a^2 - 1} \rightarrow f(\sqrt{a^2 - 1}) = -4 \rightarrow f(x) = x^2 - 4x$

①

$\Rightarrow a^2 - 1 - 4(\sqrt{a^2 - 1}) = -4 \rightarrow a^2 - 1 - 4\sqrt{a^2 - 1} + 4 = 0 \rightarrow \sqrt{a^2 - 1} = t$

$\Rightarrow t^2 - 4t + 3 = (t-1)(t-3) = 0 \rightarrow \sqrt{a^2 - 1} = t$
 $a^2 - 1 = 3 \rightarrow a^2 = 4 \rightarrow a = \pm 2$

$f(x+3) = x^2 - 4x + 9 \Rightarrow (x-3)(x-1) \Rightarrow t = x+3, x = t-3$

⑨

$f(x) = (x-3-3)(x-3-1) = (x-6)(x-4) = x^2 - 10x + 24$

$f(-3) = 9 + 30 + 24 = 63 / f(4) = 16 - 40 + 24 = 0 \Rightarrow \sqrt{63} \times 2 = 12\sqrt{3}$

$\cos x = t \Rightarrow 4t^2 + 5t = 3 \rightarrow 4t^2 + 10t - 6 = 0$

⑩

$\Rightarrow 4t^2 + 10t - 6 = 0 \rightarrow (t+1.5)(t-1) = 0 \rightarrow t = \frac{1}{4} = \frac{1}{4}$

$\Rightarrow \cos x = \frac{1}{4} \rightarrow \sin x = \pm \frac{\sqrt{15}}{4} \Rightarrow \tan x = \pm \sqrt{15}$
 $t = -\frac{1}{4} = -\frac{1}{4}$

$0 \leq \cos x \leq 1$

آترسیا آفاصله

تکلیف

$$y = \frac{1}{x+1} - \frac{2}{x-1} \geq 0$$

$$\frac{1}{x-1} + \frac{1}{x+1} \geq 2$$

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

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

$$D_f = \mathbb{R} - \{-1, 1\}$$

(الف) $y = \sqrt{\frac{x-1}{x} - \frac{x}{x-1}} \geq 0$ مفروضه

$$\frac{x^2 - 2x + 1 - x^2}{x(x-1)} = \frac{-2x+1}{x(x-1)} \geq 0$$

$$D_f = (-\infty, -\frac{1}{2}] \cup [\frac{1}{2}, 1)$$

(ب) $f(x) = \sqrt{x-1} + \sqrt{y+1} = 3$

$$\sqrt{x-1} - 3 = -\sqrt{y+1} \geq 0 \rightarrow 0 \geq \sqrt{y+1}$$

(الف) $y = \sqrt{\left(\frac{1}{x}\right)^2 - 9} \sqrt{3x-2} \geq 0$

$$D_f = (-\infty, -2] \cup \left[\frac{2}{3}, +\infty\right)$$

$\sqrt{x-1} - 3 \leq 0 \rightarrow \sqrt{x-1} \leq 3$
 $x-1 \leq 9 \rightarrow x \leq 10$
 $x-1 \geq 0 \rightarrow x \geq 1$
 $D_f = [1, 10]$

(ج) $y = \frac{\log(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1} > 0$

$$x^2 - x - 2 > 0 \rightarrow x < -1 \text{ or } x > 2$$

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

~~scribbles~~

$x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \leq -1 \text{ or } x \geq 1$

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

(د) $y = \sqrt{-x^2 + ax + 3} \geq 0$

$$\Delta = \frac{1}{4} + 12 = \frac{49}{4}$$

$$x = \frac{1 \pm 7}{-2} \rightarrow x = -2 \text{ or } x = 3$$

$$D_f = [-2, 3]$$

(ه) $f(x) - x \geq 0 \rightarrow f(x) \geq x$

$$3x - 2 \geq x \rightarrow x \geq 1$$

$g(x) = [-3, 1) \cup [1, +\infty)$

$[-3, +\infty)$

$2x + 3 \geq x \rightarrow x \geq -3$

$x < 1$

$[-3, 1)$