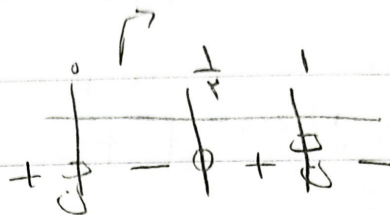


الف - $f(x) = \frac{\sqrt{(x-1)^2 - x^2}}{x(x-1)}$

$Df = (-\infty, 0) \cup [\frac{1}{4}, 1)$ - ۱

$\frac{1-x}{x(x-1)} \geq 0$



ب - $\frac{1}{x+1} - \frac{1}{x} = \frac{x-1(x+1)}{x(x+1)} = \frac{-1-x}{x(x+1)}$
 $x \neq 0, x+1 \neq 0$

$\frac{1}{x-1} + \frac{1}{x+2} = \frac{x(x+3)}{(x+2)(x-1)}$

$x+2 \neq 0$
 $x(x+3) \neq 0$
 $x-1 \neq 0$

$Df = \mathbb{R} - \{-2, -\frac{3}{2}, -1, 0, 1\}$

الف) $(\frac{1}{x})^2 - 9)(3x - x^2) \geq 0 \rightarrow (\frac{1}{x})^2 \leq 9$ - ۲

$x^2 \geq 3x \rightarrow x \leq \frac{8}{4}$ $\frac{-1 \pm \sqrt{1+4}}{2}$ $x = -2$

$Df = (-\infty, -2] \cup [\frac{8}{4}, +\infty)$

ب) $x \geq 1 \rightarrow x \geq 1, \sqrt{y+1} = 3 - \sqrt{x-1}$

$3 - \sqrt{x-1} \geq 0$

$\sqrt{x-1} \leq 3 \rightarrow x-1 \leq 1$

$x \leq 2$

استدلال
 $Df = [1, 2]$

$$\begin{aligned} (x-5)(x+1) &> 0 \\ (x-1)(x+1) &> 0 \end{aligned}$$

$$\begin{aligned} &\begin{array}{c} -1 \quad 5 \\ + \quad - \quad + \end{array} \\ &\begin{array}{c} -1 \quad 1 \\ + \quad - \quad + \end{array} \end{aligned}$$

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

مخرج صفر

$$f(x) = \sqrt{3+ax-x^2} \rightarrow 3+ax-x^2 \geq 0$$

$$\frac{c}{a} = -3 = -2b \rightarrow b = \frac{3}{2}$$

$$\frac{d}{a} = -b = 2 + \frac{3}{2} = \frac{7}{2}$$

$$\rightarrow a+b = \frac{3}{2} - \frac{1}{2} = 1$$

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

$$x \geq 1 \rightarrow 3x - 2 - x \geq 0 \rightarrow 2x \geq 2 \rightarrow x \geq 1 \rightarrow [1, +\infty)$$

$$x < 1 \rightarrow 2x - x + 3 \geq 0 \rightarrow x \geq -3 \rightarrow [-3, 1)$$

$$D_f = [-3, +\infty)$$

$$\begin{aligned} \sin \frac{2\pi}{3} &= \frac{\sqrt{3}}{2} \\ \cos \frac{2\pi}{3} &= -\frac{1}{2} \end{aligned}$$

$$f(x) = 2x^2 - 3x \rightarrow 2(1 + \frac{\sqrt{3}}{2})^2 - 3(1 + \frac{\sqrt{3}}{2}) = \frac{1}{2} + \sqrt{3}$$

$$\frac{1}{2} - \frac{3}{2} = -1$$

$$Df = R - f_1$$

inverted

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

$$f(x) = x^2 - \varepsilon x$$

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

$$g(a) = \sqrt{a^2 - 1} = 2 \rightarrow a^2 = 5 \rightarrow a = \pm\sqrt{5}$$

$$f(g(a)) = -\varepsilon$$

$$g(a) = t \rightarrow f(t) = t^2 - \varepsilon t = -\varepsilon$$

$$(t - \varepsilon)^2 = 0 \rightarrow t = \varepsilon$$

$$f(x+y) = x^2 - \varepsilon x + y$$

$$f(\varepsilon) f(-\varepsilon)$$

$$x=1 \rightarrow f(\varepsilon) = 1 + \varepsilon - \varepsilon = 1$$

$$x=-4 \rightarrow f(-\varepsilon) = 16 + 4 + \varepsilon = 20 + \varepsilon$$

$$x \rightarrow 1 \text{ or } -4$$

$$f(\varepsilon \cos x + 0 \cos x) = \tan^2 x \quad \cos^2 x \neq 0$$

$$f(\pi/4) = \varepsilon \cos^2 \pi/4 + 0 \cos^2 \pi/4 = \frac{\varepsilon}{2}$$

$$\cos x = \frac{1}{\sqrt{2}} \rightarrow x = 45^\circ$$

$$\tan^2 45^\circ = (\sqrt{2})^2 = 2$$

$$1m^2 + 10m = 25 \rightarrow 0$$

$$m^2 + 10m = 25 \rightarrow 0$$

$$(m-5)(m+15) = 0$$

$$m = \frac{\varepsilon}{\pi} = \frac{1}{\sqrt{2}}$$

$$m = \left(\frac{-V}{\varepsilon} \right) \cos x$$