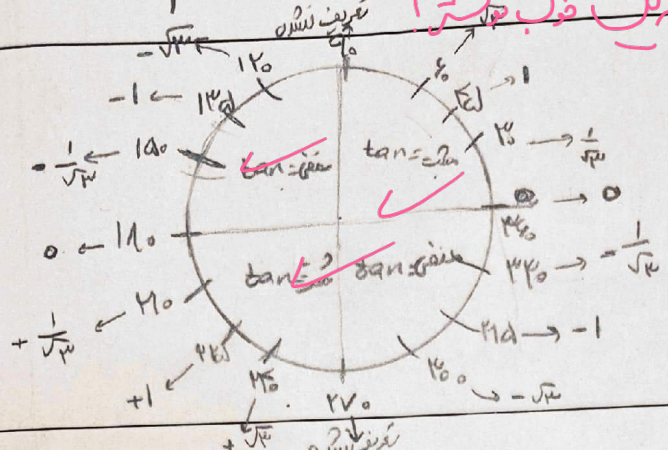


پاسخنامه تشریحی تکلیف شماره ۲



$$\tan \alpha = \frac{\sin}{\cos}$$

$$\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = \frac{\sqrt{2}}{\sqrt{2}} = 1$$

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

$$\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

الف $\sin \frac{\pi}{2} + \cos \pi + 2 \tan \frac{\pi}{4} \Rightarrow \frac{1}{1} + (-1) - 2 = \frac{1}{1} - \frac{2}{1} = -\frac{1}{1} = -1$

ب) $-\cos \frac{\pi}{4} + \sin \frac{\pi}{4} - 2 \sin \frac{\pi}{4} \Rightarrow -(\frac{\sqrt{2}}{2}) + \frac{\sqrt{2}}{2} - 2(\frac{\sqrt{2}}{2}) = -\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} - \sqrt{2} = -\sqrt{2}$

ج) $\cos \frac{\pi}{4} + 2(\cos \frac{\pi}{4}) - 2 \tan \frac{\pi}{4} \Rightarrow \frac{\sqrt{2}}{2} + 2(\frac{\sqrt{2}}{2}) - 2(1) = \frac{\sqrt{2}}{2} + \sqrt{2} - 2 = \frac{3\sqrt{2}}{2} - 2$

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{4}) \Rightarrow 1 + 1 = 2$

$f(x) = \begin{cases} x^2 + x & x > a \\ 2x + a + 1 & x \leq a \end{cases}$
 $f(1) = ?$
 $a > 0$
 $a^2 + 1 = 2a + a + 1$
 $a^2 + a - 1 = 0$
 $(a+1)(a-1) = 0$
 $a = 1$
 $f(1) = 1^2 + 1 = 2$

$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \\ a + 2x & -3 \leq x \leq -1 \end{cases}$
 $|x+1| \geq 2 \Rightarrow x+1 \geq 2 \rightarrow x \geq 1$
 $x+1 \leq -2 \rightarrow x \leq -3$
 $-3 \leq x \leq -1$
 $2(-3)^2 - b = 18 - b$
 $a + 2(-3) = a - 6$
 $18 - b = a - 6$
 $24 = a + b$

الف) $y = \frac{1}{x^2 - 2x}$
 $x^2 - 2x \neq 0 \Rightarrow x(x-2) \neq 0 \Rightarrow x \neq 0, 2$

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

الف) $y = \sqrt{\frac{x^2 - x - 6}{x^2 - 14x^2 + 44}} \geq 0$

$x^2 = t$

$\frac{(x-3)(x+2)}{(x-2)(x-4)}$

$x^2 = a \rightarrow x = \pm \sqrt{a}$

$x^2 = b \rightarrow x = \pm \sqrt{b}$

$D_f = (-\infty, -2) \cup (2, 4) \cup (4, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 2x^2 - 2x + 5}{x^2 + 2x^2 - 2x - 5}} \geq 0$

$\frac{x^2 - 2x^2 - 2x + 5}{x^2 + 2x^2 - 2x - 5}$

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

$y = \sqrt{4x - a} + \sqrt{b - 2x}$

$4x - a \geq 0 \rightarrow x \geq \frac{a}{4}$

$b - 2x \geq 0 \rightarrow x \leq \frac{b}{2}$

$D_f = \left\{ \frac{a}{4} \right\}$

$\frac{b}{a} \Rightarrow \frac{4}{14} \Rightarrow \frac{1}{4}$

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

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

$x - 1 \geq 0 \rightarrow x \geq 1$

$D_f = [1, +\infty)$

ب) $y = \frac{\sqrt{4 - 2x}}{\sqrt{4x - 2}} \geq 0 \rightarrow x \leq 2$

$4x - 2 \geq 0 \rightarrow x \geq \frac{1}{2}$

$D_f = \left(\frac{1}{2}, 2 \right]$

الف) $\sqrt{2[x] - 4} \geq 0 \rightarrow 2[x] - 4 \geq 0 \rightarrow [x] \geq 2 \rightarrow x \geq 2$

$D_f = [2, +\infty)$

ب) $y = \sqrt{2[x] - 2} \geq 0 \rightarrow 2[x] - 2 \geq 0 \rightarrow [x] \geq 1 \rightarrow x \geq 1$

$D_f = [1, +\infty)$

الف) $y = \sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{4-x}{x^2+2x+5}} \geq 0$

$\frac{x+1}{|x-1|} \geq 0 \rightarrow x \leq -1 \text{ or } x \geq 1$

$\frac{4-x}{x^2+2x+5} \geq 0 \rightarrow x \leq 4$

$D_f = [-1, 1] \cup (1, 4]$

ب) $y = \sqrt{[x] - 4} + \sqrt{4 - [x]}$

$[x] - 4 \geq 0 \rightarrow [x] \geq 4 \rightarrow x \geq 4$

$4 - [x] \geq 0 \rightarrow 4 \geq [x] \rightarrow x < 5$

$D_f = \emptyset$