

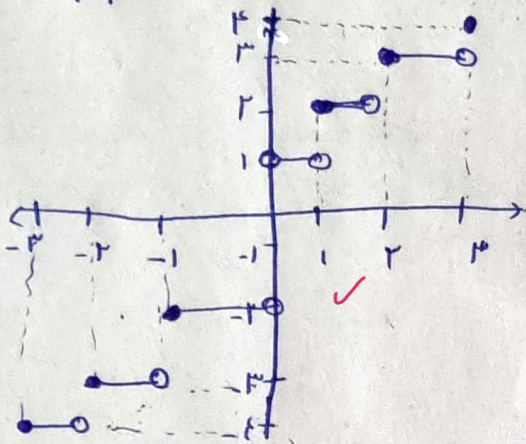
1- (1) $f(t) = p \sin^2\left(\omega + \frac{\pi}{f}\right) + s \sin^2 t - 1 \rightarrow \sin^2 t \rightarrow y \leq |s|$
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2- $y(t) = p \cos^2 \omega - p$

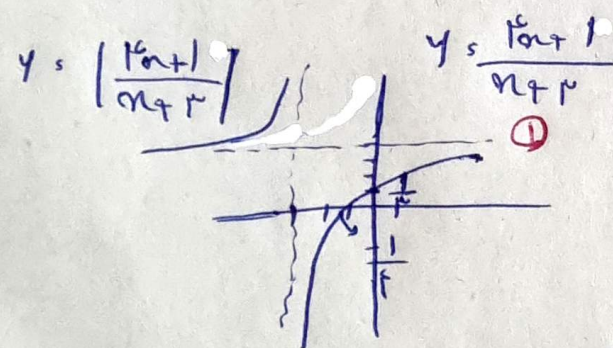
3- $-1 \leq \cos^2 \omega \leq 1 \rightarrow -p \leq p \cos^2 \omega - p \leq 1$

$R_y = [-p, 1]$

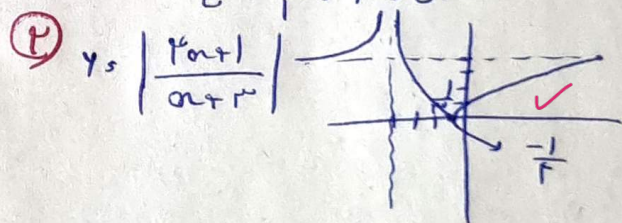
$y = \frac{p}{|n|} + [n] \quad D_f: [-3, 3]$



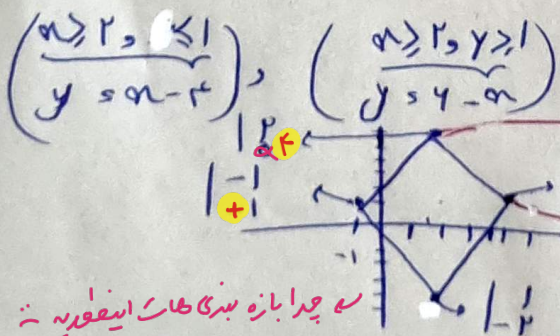
4- $-3 \leq n < -1 \rightarrow [n] = -3 \rightarrow \frac{p}{-n} - 3 \leq -1$
 $-1 \leq n < 0 \rightarrow [n] = -2 \rightarrow \frac{p}{-n} - 2 \leq -1$
 $0 \leq n < 1 \rightarrow [n] = -1 \rightarrow \frac{p}{-n} - 1 \leq -1$
 $1 \leq n < 2 \rightarrow [n] = 0 \rightarrow \frac{p}{n} - 0 \leq 1$
 $2 \leq n < 3 \rightarrow [n] = 1 \rightarrow \frac{p}{n} + 1 \leq 2$
 $n = 3 \rightarrow [n] = 3 \rightarrow \frac{p}{n} + 3 \leq 4$



5- $y = \frac{|p(n+1)|}{n+3} \rightarrow$ همواره مثبت
 $n+3 \leq 0 \rightarrow n \leq -3 \rightarrow$ منفی
 $\frac{p}{n} \leq \frac{1}{n} \leq 3 \rightarrow$ معکوس



6- $|n-2| + |y-1| = 3$
 if $n \geq 2 \rightarrow n-2 + |y-1| = 3 \rightarrow |y-1| = 3 - n$
 $n \leq 2 \rightarrow 2-n + |y-1| = 3 \rightarrow |y-1| = 1 + n$
 $|y-1| = 3 - n \rightarrow y \geq 1 \rightarrow y \leq 4 - n$
 $|y-1| = 1 + n \rightarrow y \geq 1 \rightarrow y \leq n+2$
 $|y-1| = 1 + n \rightarrow y \leq 1 \rightarrow y \geq -n$



نقاط تقاطع
 خطوط مربع است
 نشان دهنده مربع است

به جدا بازه بندی نقاط اینگونه است:

الف) $f(x) = x + \frac{1}{x} + \sqrt{x + \frac{1}{x}} \rightarrow \sqrt{x + \frac{1}{x}} \quad x \rightarrow f(x) = t^2 + \sqrt{t} \quad (2) - \omega$

$t_{\max} = +\infty \rightarrow y \rightarrow +\infty$

$R_f = [1 + \sqrt{1}, +\infty)$ $\begin{cases} t_{\min} = \sqrt{1} \rightarrow 1 + \sqrt{1} = y \\ \frac{-b}{2a} = \frac{-1}{2} = -1 \times \rightarrow \sqrt{x + \frac{1}{x}} \text{ غير معرف} \end{cases}$

ب) $y = (1 - \sin \alpha)(1 + \sin \alpha) \rightarrow y = -\sin^2 \alpha + \sin \alpha + 1$

$R_f = [0, 1]$ $\begin{cases} \sin \alpha_{\max} = 1 \rightarrow y = -1 + 1 + 1 = 1 \\ \sin \alpha_{\min} = -1 \rightarrow y = -1 - 1 + 1 = -1 \\ \sin \alpha = \frac{-b}{2a} \rightarrow \frac{-1}{-2} = \frac{1}{2} \rightarrow y = \frac{1}{4} \end{cases}$

$f(x) = \frac{1}{x}x + 1 \rightarrow x \in [1, 10]$ $S_q = \frac{1}{x}x + 1 + \frac{1}{x}x + 1$

$S_q = \frac{1}{x}x(1 + 1 + 1 + 1) + 1 \times 10 = \frac{4x}{x} + 10 = 4 + 10 = 14$

$f(x) = \sqrt{ax^2 + bx + c} \rightarrow R_f = [1, +\infty)$ $f(x) = 1$

$\sqrt{ax^2 + bx + c} = 1 \Rightarrow ax^2 + bx + c = 1$

$x = 1 \rightarrow \sqrt{1b + c} = 1 \Rightarrow 1b + c = 1$

$\sqrt{1b + c} = 0 \Rightarrow 1b + c = 0$

$\sqrt{1b + c} = 1 \Rightarrow 1b + c = 1$

$\sqrt{1b + c} = 0 \Rightarrow 1b + c = 0$

$g(x) = \sqrt{bx^2 + ax - 1c} = \sqrt{x^2 + 0 + 1} = \sqrt{x^2 + 1}$

$R_f = [1, +\infty)$

$f(x) = \frac{x^2 - 1}{x + 1}$ $R_f = \mathbb{R} - \{a, b\}$ $R_f = [c, +\infty) = [1, +\infty)$

$f(x) = \frac{x(x-1)(x+1)}{(x+1)}$ $x(x-1) \rightarrow x^2 - 1 \rightarrow \text{ext} \left|_{-1}^1 \rightarrow R_f = [-1, +\infty)$

$x^2 - 1 \neq 1 \rightarrow x^2 - 1 = 1 \rightarrow (x-1)(x+1) \neq 0 \rightarrow x \neq 1, x \neq -1$

$f\left(\frac{a+b}{c}\right) = f\left(\frac{1-1}{-1}\right) = f(-1) = 1$

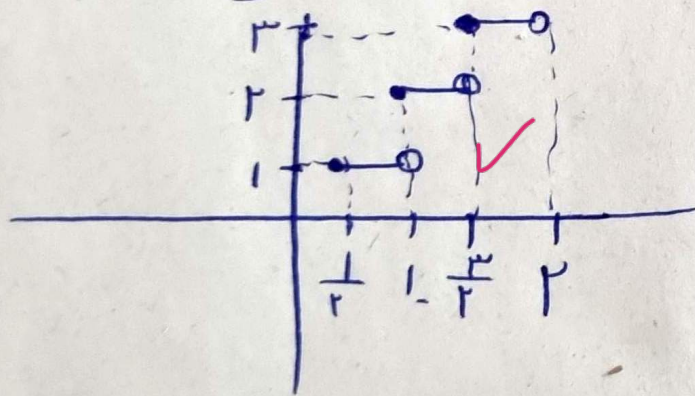
$$y = \sqrt{ax^2 + bx + c} \quad D_f[a, b]$$

(2) -9

$$\text{left} \rightarrow (n-1)^2 \leq n^2 - 4n + 1 < n^2 - 1 \rightarrow \begin{cases} a = -4 \\ b = 1 \end{cases} D_f[-4, 1]$$

$$n = -4 \rightarrow y = -1, \quad n = 1 \rightarrow y = 1 \rightarrow R_f[-1, 1]$$

$$y = [n] + [n + \frac{1}{r}] \quad (\frac{1}{r}, r)$$



$$\frac{1}{r} \leq n < 1 \rightarrow [n] = 0, [n + \frac{1}{r}] = 1 \quad \text{by } 1$$

$$1 \leq n < \frac{3}{2} \rightarrow [n] = 1, [n + \frac{1}{r}] = 1 \rightarrow y = 2$$

$$\frac{3}{2} \leq n < 2 \rightarrow [n] = 1, [n + \frac{1}{r}] = 2 \rightarrow y = 3$$