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r = 1/2

$$1 - x^2 + y^2 - \varepsilon x + 4y + k = 0 \Rightarrow x^2 + y^2 - \varepsilon x + 4y - 10 + 10 + k = 0 \Rightarrow x^2 + y^2 - \varepsilon x + 4y - 10 + k = 0$$

$$\Rightarrow r(x-r)^2 + (y+r)^2 - 10 + k = 0 \Rightarrow k = 10$$

$$r(n-1)^2 + (y+r)^2 = 11 - k \rightarrow k = 11$$

$$r - f(n) = \begin{cases} x^2 + \varepsilon x & ; x \geq a \\ x^2 + a + \varepsilon & ; x \leq a \end{cases}$$

$$x \geq a \Rightarrow a^2 + \varepsilon a \geq x^2 + a + \varepsilon \Rightarrow a^2 + a - \varepsilon = 0 \Rightarrow (a-1)(a+1) \geq 0$$

$$D(1) \geq 0 \Leftrightarrow a \geq 1 \Leftrightarrow a \geq 1$$

$$r - f(n) = \begin{cases} x^2 - b & ; |x| \geq r \\ a + \varepsilon x & ; -r \leq x \leq r \end{cases}$$

$$\begin{cases} x+1 \geq r \Rightarrow x \geq r-1 \\ x+1 \leq r \Rightarrow x \leq r-1 \end{cases} \Rightarrow x \geq r-1, 1-b \geq a + \varepsilon \Rightarrow a+b \geq \varepsilon$$

$$2 - y = \sqrt{x-a} + \sqrt{b-x} \quad D_f = \{x\} \Rightarrow \sqrt{x-a} + \sqrt{b-x} \geq 0 \Rightarrow a \geq x, b \geq x$$

$$\downarrow$$

$$\frac{b}{a} \geq \frac{1}{1}$$

$$a - (1) y = \sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{x-n}{x^2+x+1}}$$

$$\frac{x-n}{x^2+x+1} \geq 0 \Rightarrow x^2+x+1 \geq 0 \Rightarrow \Delta \leq 0 \Rightarrow \text{false}$$

$$\frac{x+1}{|x-1|} \geq 0 \Rightarrow x \neq 1 \Rightarrow x+1 \geq 0 \Rightarrow x \geq -1$$

$$\cap \Rightarrow D_f = [-1, 4] - \{1\}$$

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

$$\Rightarrow [x-1] \geq 0 \Rightarrow [x] \geq 1 \Rightarrow x \geq 1$$

$$1-[x] \geq 0 \Rightarrow [x] \leq 1 \Rightarrow x \leq 1$$

$$\cap, \emptyset \Rightarrow D_f = \emptyset$$

$$y - (1) y = \sqrt{\frac{x^2-n-4}{x^2-13x^2+44}}$$

$$\Rightarrow \frac{x^2-n-4}{x^2-13x^2+44} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{(x^2-13)(x^2-4)} = \frac{(x-1)(x+1)}{(x-1)^2(x+1)(x-1)(x+1)}$$

$$\Rightarrow D_f = (-\infty, 2) \cup (2, 7) \cup (7, +\infty)$$

$$- y = \sqrt{\frac{x^2-13x^2-4n+4}{x^2-13x^2-4n-4}}$$

$$\Rightarrow \frac{x^2-13x^2-4n+4}{x^2-13x^2-4n-4} \geq 0 \Rightarrow \frac{(x-1)(x^2-n-4)}{(x-1)(x^2-n-4)} = \frac{(x-1)(x^2-n-4)}{(x-1)(x^2-n-4)}$$

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

$$\Rightarrow \frac{-x^2-13x^2-4n+4}{x^2-13x^2-4n-4} \geq 0 \Rightarrow D_f = (-\infty, -1) \cup [-1, 1) \cup (1, 2) \cup [2, +\infty)$$

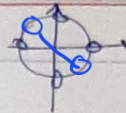
$$1- \text{a)} y = \sqrt{[-n]-r} \Rightarrow [-n] \geq r \rightarrow -[n]$$

$$D = (-\infty, r]$$

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$$1- \text{b)} y = \frac{an^2+4}{[n]-r[n]-r}$$

$$\Rightarrow [n]^2 - r[n] - r \neq 0 \Rightarrow ([n]-r)([n]+1) \neq 0 \Rightarrow [n] \neq r \Rightarrow n \in [r, \infty) \\ [n] \neq -1 \Rightarrow n \in (-r, -1] \Rightarrow D_f = \mathbb{R} - (-r, -1] \cup [r, \infty)$$



$$1- \text{c)} y = \frac{\cos n+1}{\tan n+1}$$

$$\Rightarrow \sin n \neq 0, \cos n \neq 0 \Rightarrow n \neq \frac{k\pi}{r}$$

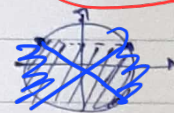
$$\frac{\sin n}{\cos n} \neq -1 \Rightarrow$$

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$$1- \text{d)} y = \sqrt{1-\varepsilon \sin^2 n}$$

$$\Rightarrow \varepsilon \sin^2 n \leq 1$$

$$\Rightarrow \sin^2 n \leq \frac{1}{\varepsilon} \Rightarrow \sin n \leq \frac{1}{\sqrt{\varepsilon}} \Rightarrow n \in \left[\frac{\pi}{2}, \frac{\pi}{\sqrt{\varepsilon}} \right]$$



$$9- \text{a)} y = \sqrt{1 - \log \frac{n-1}{r}} \quad \log \frac{n-1}{r} \geq 1 \Rightarrow n-1 \geq \frac{1}{2} \Rightarrow n \geq r \\ \Rightarrow n-1 > 0 \Rightarrow n > 1 \quad \text{a)} \frac{r}{r} \Rightarrow D_f = [r, +\infty)$$

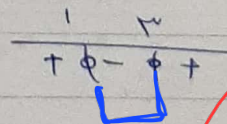
$$D = \left[\frac{r}{r}, +\infty \right)$$

$$1- \text{e)} y = \sqrt{\frac{n^2-n}{1-\log \frac{n^2-n}{r}}}$$

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$$10- \text{a)} y = \sqrt{\frac{n^2-n^2}{r}-1} \quad \frac{n^2-n^2}{r} \geq \frac{r}{r} \Rightarrow \varepsilon n - n^2 \geq r \Rightarrow n^2 - \varepsilon n + r \leq 0 \Rightarrow (n-r)(n-1) \leq 0$$

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



$$1- \text{b)} y = \left(\frac{kn+a}{rkn+\varepsilon} \right) ! \Rightarrow \frac{rkn+a}{rkn+\varepsilon} \in \mathbb{W} \Rightarrow n \in \frac{rkn+a}{rkn+\varepsilon}$$

$$D_f = \left\{ n \mid n \equiv k \left(k \in \frac{rkn+a}{rkn+\varepsilon} \right) \right\}$$

$$D = \left\{ n \mid n = \frac{-rk+a}{rk-\varepsilon}, k \in \mathbb{W} \right\}$$

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