

①

الف) $2n^3 + 3n^2 - 11n + 3 \neq 0 \Rightarrow$ جمع ضرب = 0

$(n-1)(2n^2 + 5n + 3) \neq 0$ $\leftarrow$ بزرگترین $n=1$ $\leftarrow$ قسمة

$(n-1)(2n-1)(n+3) \neq 0 \Rightarrow n \neq 1, \frac{1}{2}, -3$

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

ب) $2n^3 + 9n^2 + 10n + 3 \neq 0$ $\leftarrow$ جمع ضرب بزرگترین = 0

$(n+1)(2n^2 + 7n + 3) \neq 0$ $\leftarrow$ جمع ضرب بزرگترین = 0

$(n+1)(2n+1)(n+3) \neq 0$ $\leftarrow$ بزرگترین $n+1$ $\leftarrow$ قسمة

$n \neq -1, -\frac{1}{2}, -3$

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

②

الف) $x^3 - 2x^2 + 2x - 1 \neq 0$ $\leftarrow$ جمع ضرب = 0

$(n-1)(n^2 - n + 1) \neq 0$ $\leftarrow$ بزرگترین $n=1$ $\leftarrow$ قسمة

$\Delta < 0$

$n \neq 1$

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

ب) $\sqrt{\frac{x+3}{x^3 - 2x^2 + 2x - 1}} \Rightarrow \frac{-3}{+} \mid \frac{1}{-0+}$ $(1, +\infty)$

$(n-1)(n^2 - n + 1)$ $\leftarrow$ بزرگترین

③

1) $x \geq 1 \rightarrow x^2 - 7x + 10 \rightarrow (x-2)(x-5) \rightarrow x \neq 2, 5$

2) $x < 1 \rightarrow x^2 + 3x = x(x+3) \neq 0 \rightarrow x \neq 0, -3$

$P_f = \mathbb{R} - \{-3, 0, 2, 5\}$

الف) $y = \sqrt{[-x] - 2}$

(3)

$$[-x] - 2 \geq 0 \quad [-x] \geq 2 \Rightarrow x \leq -2$$

$$Pf = (-\infty, -2]$$

ب) $[x]^2 - 2[x] - 3 \neq 0$

$$[x] \leq t \rightarrow (t^2 - 2t - 3 \neq 0) \quad t = 3, [x] \rightarrow 3 < x < 4$$

$$(t-3)(t+1) \neq 0 \quad t = -1 \leq [x] \rightarrow -1 \leq x < 0$$

$$Pf = \mathbb{R} - \{[-1, 0) \cup [3, 4)\}$$

الف) $[x - \frac{1}{k}] + [x + \frac{1}{k}] \geq 0$

(4)

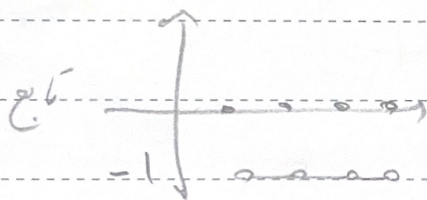
$$2[x - \frac{1}{k}] + 1 \geq 0 \Rightarrow [x - \frac{1}{k}] \geq -\frac{1}{2} \Rightarrow [x - \frac{1}{k}] \geq 0$$

$$x - \frac{1}{k} \geq 0 \Rightarrow x \geq \frac{1}{k}$$

$$Pf = [\frac{1}{k}, +\infty)$$

ب) $[x - \frac{1}{k}] + [\frac{1}{k} - x] \rightarrow$ فرم

$$[x] - [-x]$$



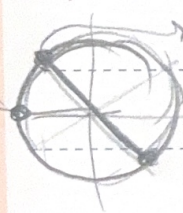
$$x - \frac{1}{k} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{k}$$

$$Pf = \{x \mid x = k, k \in \mathbb{Z} + \frac{1}{k}\}$$

$$\subseteq Pf = \{x \mid x = k + \frac{1}{k}, k \in \mathbb{Z}\}$$

الف) $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$

(5)



$$K\pi - \frac{\pi}{4}$$

$$\sin x \neq 0 \Rightarrow x \neq K\pi$$

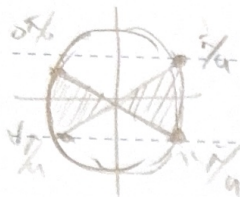
$$\cos x \neq 0 \Rightarrow x \neq K\pi + \frac{\pi}{2}$$

$$Pf = \mathbb{R} -$$

$$\{K\pi, K\pi + \frac{\pi}{4}, K\pi - \frac{\pi}{4}\}$$

$$b) 1 - r \sin^2 x \geq 0$$

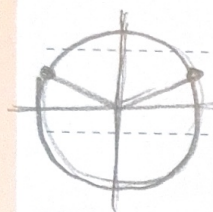
$$r \sin^2 x \leq 1 \Rightarrow -\frac{1}{r} \leq \sin x \leq \frac{1}{r}$$



$$\rightarrow P_f = [k\pi - \pi/4, k\pi + \pi/4]$$

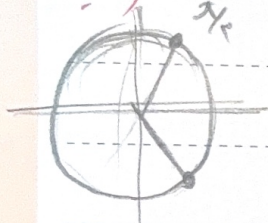
$$r \sin x \geq 1$$

$$a) r \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{r}$$



$$P_f = [k\pi + \pi/4, k\pi + 3\pi/4]$$

$$b) 1 - r \cos x \geq 0 \Rightarrow r \cos x \leq 1 \Rightarrow \cos x \leq \frac{1}{r}$$



$$P_f = [k\pi + \pi/2, k\pi + 3\pi/2]$$

$$a) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1$$

$$D \rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 \Rightarrow [-3, 0]$$

$$D \cap P \Rightarrow [-3, -1] \cup [-1, 0]$$

$$(x+1)/(x+3) \geq 0 \Rightarrow \frac{-1}{-1+3} \Rightarrow (-\infty, -3] \cup [-1, \infty)$$

ب) $\mathbb{Q} \sim \sqrt{a-2n} \geq 0 \Rightarrow n \leq \frac{a}{2}$

$\mathbb{Q} \sim \sqrt{a-2n} \leq 1 \Rightarrow a-2n \leq 1 \Rightarrow n \geq \frac{a-1}{2}$
 $\mathbb{Q} \cap \mathbb{P} \Rightarrow P_f = \left[\frac{a-1}{2}, \frac{a}{2} \right]$

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$\mathbb{Q} \sim 2 > 0$

$\mathbb{Q} \cap \mathbb{P} \sim P_f = (0, 2)$

الف)

$\mathbb{Q} \sim 1 - \log_3^n > 0 \Rightarrow \log_3^n < 1 \Rightarrow n < 3$

$\mathbb{Q} \sim n > 0 \Rightarrow P_f = \mathbb{Q} \cap \mathbb{P} = (1, +\infty)$

ب) $\mathbb{Q} \sim 1 - \log_{\frac{1}{4}}^n > 0 \Rightarrow \log_{\frac{1}{4}}^n < 1 \Rightarrow n > \frac{1}{4}$
 $0.3 < 1$

الف) $2^{n-n^2} - 1 \geq 0 \Rightarrow 2^{n-n^2} \geq 1 = 2^0 \Rightarrow P_f = [1, 2]$ (10)

$2^{n-n^2} \geq 2^0 \Rightarrow n^2 - n \leq 0 \Rightarrow \frac{n^2 - n}{(n-1)(n-0)} \leq 0$

ب) $\frac{r_n + a}{r_n + c} \in W \Rightarrow -\frac{cW - a}{rW - r} \Rightarrow P_f = \left\{ n \mid n = \frac{a-cW}{rW-r}, kW \right\}$