

①

$$(الف) x^p - \omega x - \gamma = 0$$

$$\rightarrow x^p - \omega x - \gamma = 0$$

$$(x-1)(x+\gamma) = 0 \rightarrow x=1 \quad x=-\gamma \xrightarrow{\frac{1}{\gamma}} \omega_{\text{مستقر}} = \frac{1}{\gamma} \gamma - \frac{1}{\gamma} = \frac{\gamma}{\gamma} - \frac{1}{\gamma} = \frac{\gamma-1}{\gamma}$$

$$(ب) x^p - \lambda x - \gamma = 0$$

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②

$$(الف) x^p - \omega x - \gamma = 0 \rightarrow (x-1)(x+\gamma) = 0 \rightarrow x=1, x=-\gamma$$

$$(ب) x^p + \omega x + \gamma = 0 \rightarrow a+c \neq b \rightarrow x=1, x=-\gamma/a = \gamma/p \quad \rightarrow a \rightarrow x^p + \omega x + \gamma = 0$$

$$(ج) x^p + \gamma x + \gamma = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow \Delta = \gamma^2 - 4\gamma = -4 < 0$$

$$(د) x^p + \gamma x - \gamma = 0$$

$$\Delta = b^2 - 4ac = \gamma^2 + 4\gamma = 4\gamma$$

$$x_0 = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-\gamma \pm \sqrt{4\gamma}}{2\gamma}$$

③

$$A = \{b, \gamma, \gamma\}$$

$$B = \{\gamma, \gamma\}$$

$$A \times B = \{(1, \gamma), (1, \gamma), (\gamma, \gamma), (\gamma, \gamma), (\gamma, \gamma), (\gamma, \gamma)\}$$

$$B \times B = \{(\gamma, \gamma), (\gamma, \gamma), (\gamma, \gamma), (\gamma, \gamma)\}$$

$$A \times B - B \times B = \{(1, \gamma), (1, \gamma)\}$$

④

(الف)

$$m^p = m + \gamma \rightarrow m^p - m - \gamma = 0 \rightarrow m = -1 \quad \checkmark$$

$$m = -1$$

$$1 \rightarrow m = \gamma \rightarrow \omega_{\text{مستقر}} = (\gamma, \gamma)$$

(ب)

$$m^p = m + \gamma \rightarrow m = -1 \rightarrow \omega_{\text{مستقر}} = (-1, \gamma)$$

$$1 \rightarrow m = \gamma \rightarrow \omega_{\text{مستقر}} = (\gamma, \gamma)$$

مستقر

⑤

$$a^p - \gamma a + \gamma = 0 \rightarrow a = 1 \rightarrow \omega_{\text{مستقر}} = (1, \gamma)$$

$$1 \rightarrow a = \gamma \rightarrow \emptyset$$

⑥

$$f(x) = \begin{cases} x^p - 1 & x \leq 1 \\ ax + b & 1 \leq x \leq \gamma \\ x^p & x > \gamma \end{cases} \rightarrow x=1 \rightarrow y=0 \quad a=-b \rightarrow b=-1 \rightarrow a=1$$

$$\rightarrow x=\gamma \rightarrow y=1$$

$$a \times b = -1$$

⑤ $f(x) = \begin{cases} px - p \\ e - px \end{cases} \rightarrow px - p = e - px$
 $\omega K = V \rightarrow K = \frac{V}{\omega}$

⑧ الف) $y'' - 4y = x^2 - 4x + 3$ $\alpha = 1 \rightarrow y'' - 4y = 0 \rightarrow y = 0$
 $y(y'' - 4) \rightarrow y = \pm \sqrt{4}$. مطلوب

ب) $|x| + |y| = 1$ $\alpha = +1 \rightarrow |x| = 1 \rightarrow |y| = 1 \rightarrow y = 1$
 $\rightarrow y = -1$. مطلوب

ج) $|y| = \sqrt{1 - \cos x}$
مطلوب

أو $\alpha = -\pi \rightarrow |y| = \sqrt{2} \rightarrow y = \pm \sqrt{2}$. مطلوب

د) $y'' + x^2 + 2x + 1 = 0$

$y'' + (x+1)^2 = 0 \rightarrow y'' = 0 \rightarrow y = 0$
 $\rightarrow y = -1$. مطلوب

⑨ الف) $y'' + x^2 = px - p$ $\sqrt{y_1} = \sqrt{y_2} \Rightarrow y_1 = y_2$. مطلوب
 $y'' + x^2 - px + p = 0$ $\rightarrow y_1 = y_2$
 ب) $y'' + py = \omega x$ $\rightarrow y_1 = y_2$
 $y_1'' + py_1' = \omega x_1$
 $y_2'' + py_2' = \omega x_2$

$y_1'' - y_2'' = -p(y_1 - y_2)$
 $\rightarrow (y_1 - y_2)(y_1'' + y_2'' + y_1 y_2) = -p(y_1 - y_2)$
 $(y_1 - y_2)(y_1'' + y_2'' + y_1 y_2 + p) = 0$

$\rightarrow y_1'' + y_2'' + y_1 y_2 + p = 0 \rightarrow y_1'' - p(y_1'' + p)$

$y_1'' - p y_1'' - p = 0 \rightarrow -p y_1'' - p = 0 \rightarrow -p(y_1'' + 1) = 0$
 $y_1'' + 1 = 0 \rightarrow y_1'' = -1$. مطلوب

مطلوب $y_1 = y_2$

⑩ الف) $x \sin y = y \sin x \rightarrow x = -\pi$ $-\pi \times \sin y = y \times 0$

$\sin y = 0 \rightarrow$

مطلوب $y = -\pi, \pi$

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = p$

أو $a + \frac{1}{a} = [p, \infty) \rightarrow a > 0$

$\sqrt{\frac{x}{y}} = 1 \rightarrow x = y$. مطلوب