

19-2-2026

$$4) \quad v_1, v_2, \quad v^3 - 3v^2 - 7v - 15 = 0$$

$$2v - 9 = \sqrt{v-4} \quad (v_1 \geq 3, v_2 \geq 3)$$

Appl: $v_1 = v_2$

$$v^3 - 3v^2 - 7v - 15 = 0 \Leftrightarrow (v-5)(v^2 + 2v + 3) = 0$$

$$\begin{array}{ccc|c} 1 & -3 & -7 & -15 \\ \hline 1 & 5 & 10 & 15 \\ \hline 1 & 9 & 3 & 0 \end{array} \quad v=5$$

$$v=5 \quad \downarrow$$

$$v^2 + 2v + 3 = 0$$

$$\Delta = 2^2 - 4 \cdot 1 \cdot 3 = -8 < 0$$

Appl: $v_1 = 5$

$$\text{For } v=5: 2v-9 = \sqrt{v-4}$$

$$2 \cdot 5 - 9 = \sqrt{5-4}$$

I guess it is

$$\text{Appl: } v_1 = v_2 = 5$$

$$5) \quad \varphi_v < 90^\circ \Leftrightarrow 180^\circ - \frac{360^\circ}{v} < 90^\circ \Leftrightarrow$$

$$\Leftrightarrow 180 - 90^\circ < \frac{360^\circ}{v} \Leftrightarrow$$

$$\Leftrightarrow 90^\circ < \frac{360^\circ}{v} \Leftrightarrow 90v < 360^\circ \Leftrightarrow$$

$$\Leftrightarrow v < 4$$

$$\text{and } v \geq 3$$

$$\left. \begin{array}{l} \Leftrightarrow v < 4 \\ \text{and } v \geq 3 \end{array} \right\} \quad v=3$$

$$6) \quad M > V \quad (M \geq 3, V \geq 3)$$

$$i) \quad \lambda_v^2 - \lambda_M^2 = 4(a_M^2 - a_v^2)$$

$$a_v^2 + \frac{\lambda_v^2}{4} = R^2 \quad \left\{ \begin{array}{l} a_v^2 + \frac{\lambda_v^2}{4} = a_M^2 + \frac{\lambda_M^2}{4} \Leftrightarrow \\ a_M^2 + \frac{\lambda_M^2}{4} = R^2 \end{array} \right.$$

$$\Leftrightarrow 4a_v^2 + \lambda_v^2 = 4a_M^2 + \lambda_M^2 \Leftrightarrow$$

$$\Leftrightarrow \lambda_v^2 - \lambda_M^2 = 4a_M^2 - 4a_v^2 \Leftrightarrow$$

$$\Leftrightarrow \lambda_v^2 - \lambda_M^2 = 4(a_M^2 - a_v^2)$$

$$ii) \quad \lambda_v > \lambda_M \Leftrightarrow a_v < a_M$$

$$\lambda_v > \lambda_M \Leftrightarrow \lambda_v^2 > \lambda_M^2 \Leftrightarrow \lambda_v^2 - \lambda_M^2 > 0 \Leftrightarrow 4(a_M^2 - a_v^2) > 0 \Leftrightarrow$$

$$\Leftrightarrow a_M^2 - a_v^2 > 0 \Leftrightarrow a_M^2 > a_v^2 \Leftrightarrow$$

$$\Leftrightarrow a_M > a_v$$

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