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Nomor 2

h.) $\bar{A} = \hat{A} + BK$

$$= \begin{bmatrix} 1 & 0 \\ 6 & -1 \end{bmatrix} + \begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} K_1 & K_2 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 \\ 6 & -1 \end{bmatrix} + \begin{bmatrix} K_1 & K_2 \\ K_1 & K_2 \end{bmatrix}$$

$$= \begin{bmatrix} 1+K_1 & K_2 \\ 6+K_1 & -1+K_2 \end{bmatrix}$$

$$\hookrightarrow \det\left(\begin{bmatrix} \bar{\lambda} & 0 \\ 0 & \bar{\lambda} \end{bmatrix} - \begin{bmatrix} 1+K_1 & K_2 \\ 6+K_1 & -1+K_2 \end{bmatrix} \right) = 0$$

$$\det \begin{bmatrix} \bar{\lambda} - (1+K_1) & -K_2 \\ -(6+K_1) & \bar{\lambda} - (K_2 - 1) \end{bmatrix} = 0$$

$$(\bar{\lambda} - 1 - K_1)(\bar{\lambda} - K_2 + 1) - (K_2(6+K_1)) = 0$$

$$(\bar{\lambda}^2 - K_2\bar{\lambda} \cancel{+\bar{\lambda}} \cancel{-\bar{\lambda}} + K_2 - 1 - \bar{\lambda}K_1 + K_1K_2 - K_1) - 6K_2 + K_1K_2 = 0$$

$$\bar{\lambda}^2 - \bar{\lambda}(K_1 + K_2) + (K_2 - K_1 - 6K_2 + K_1K_2 - 1) = 0$$

$$\bar{\lambda}^2 - \bar{\lambda}(K_1 + K_2) + (K_1K_2 - K_1 - 5K_2 - 1) = 0$$

$$\bar{\lambda}_{1,2} = \frac{(K_1 + K_2) \pm \sqrt{(K_1+K_2)^2 - 4(K_1K_2 - K_1 - 5K_2 - 1)}}{2}$$

$\bar{\lambda}_1 = \bar{\lambda}_2 = -1$

$(\bar{\lambda} - \bar{\lambda}_1)(\bar{\lambda} - \bar{\lambda}_2) = 0$

$(\bar{\lambda} + 1)(\bar{\lambda} + 1) = 0$

$\bar{\lambda}^2 + 2\bar{\lambda} + 1 = 0$

maka,

$-(K_1 + K_2) = 2$

$K_1 + K_2 = -2$

$K_1 = -2 - K_2$

- $K_1K_2 - K_1 - 5K_2 - 1 = 1$

  $K_1K_2 - K_1 - 5K_2 = 2$

  $(-2 - K_2)K_2 + 2 + K_2 - 5K_2 = 2$

  $-2K_2 - K_2^2 - 4K_2 = 0$

  $K_2^2 + 6K_2 = 0$

  $K_2(K_2 + 6) = 0$

- $K_1 = -2 - (-6)$

  $K_1 = 4$

- $K_1 = -2 - 0$

  $K_1 = -2$

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Kemungkinan nilai gain

$K_2 = 0 \quad \vee \quad K_2 = -6$

$K_1 = -2 \quad \vee \quad K_1 = 4$

gain matriks

$K = \begin{bmatrix} -2 & 0 \end{bmatrix}$ atau $\begin{bmatrix} 4 & -6 \end{bmatrix}$