


$$1) \quad K(\omega) = \begin{cases} 0 & : \omega \leq 0 \\ \omega & : \omega > 0 \end{cases}$$

$$2) \quad \begin{pmatrix} \omega^* \\ x^* \end{pmatrix} = \begin{cases} \begin{pmatrix} \frac{v_1 + v_2}{2} \\ \frac{v_1 + v_2}{2} \end{pmatrix} & : \quad \frac{v_1 + v_2}{2} \geq 0 \\ \begin{pmatrix} v_1 \\ 0 \end{pmatrix} & : \quad v_1 \leq 0 \\ \begin{pmatrix} 0 \\ 0 \end{pmatrix} & : \quad \frac{v_1 + v_2}{2} \leq 0 \text{ and } v_1 \geq 0 \end{cases}$$

Both
Valid
when
 $\frac{v_1 + v_2}{2} \geq 0$
& $v_1 \leq 0$

2.)

$$\begin{pmatrix} \omega^* \\ x^* \end{pmatrix} = \left\{ \begin{array}{ll} \begin{pmatrix} \frac{v_1 + v_2}{2} \\ \frac{v_1 + v_2}{2} \end{pmatrix} & : \begin{array}{l} \frac{v_1 + v_2}{2} \geq 0 \\ v_1 \geq 0 \end{array} \\ \\ \begin{pmatrix} v_1 \\ 0 \end{pmatrix} & : \begin{array}{l} v_1 \leq 0 \\ \frac{v_1 + v_2}{2} \leq 0 \end{array} \\ \\ \begin{pmatrix} 0 \\ 0 \end{pmatrix} & : \begin{array}{l} \frac{v_1 + v_2}{2} \leq 0 \\ v_1 \geq 0 \end{array} \\ \\ \begin{pmatrix} \frac{v_1 + v_2}{2} \\ \frac{v_1 + v_2}{2} \end{pmatrix} \text{ or } \begin{pmatrix} v_1 \\ 0 \end{pmatrix} & : \begin{array}{l} \frac{v_1 + v_2}{2} \geq 0 \\ v_1 \leq 0 \end{array} \end{array} \right.$$