MA152 Solutions to Homework 6

June 7, 2017

1. (a) We have

\[ A = \begin{pmatrix} 1 & 5 \\ 0 & 4 \end{pmatrix} \]

\[ B = \begin{pmatrix} 1 & 0 \\ 5 & 4 \end{pmatrix} \]

In \( A \), 1 is a saddle point so \( v_I = 1 \). In \( B^T \), 1 is a saddle point. So \( v_{II} = 1 \).

(b) We have

\[ v_I = \text{Val} \begin{pmatrix} 3 & 1 \\ 2 & 4 \end{pmatrix} \]

This is a \( 2 \times 2 \) matrix without a saddle point, so we can find its value by looking for equalizing strategies. We get \( v_I = 5/2 \).

\[ v_{II} = \text{Val} \begin{pmatrix} 10 & 0 \\ 5 & 20 \end{pmatrix} \]

This also doesn’t have a saddle point, looking for equalizing strategies we find \( v_{II} = 8 \).

2. This is a textbook exercise, Part III section 2 question 3. The answer is in the online solutions.

3. This is a textbook exercise, Part III section 2 question 4.

4. This is a textbook exercise, Part III section 3 question 2.

5. This is a textbook exercise, Part III section 3 question 6.