Practice worksheet | Matrix models

Transition matrices and state vectors

Name: _____ Date: _____

6 questions | 20 marks

1. Use rows $\begin{pmatrix} 0.7 & 0.2 \\ 0.3 & 0.8 \end{pmatrix}$ to update $(80, 20)$. [3 marks]

2. Rows of a proposed closed transition matrix are $(0.4, 0.3), (0.5, 0.7)$. Is it valid? [3 marks]

3. Find a, b so rows $\begin{pmatrix} 0.75 & a \\ b & 0.6 \end{pmatrix}$ form a column-stochastic matrix. [3 marks]

4. A state vector is $(120, 80)$. What total must a closed transition preserve? [3 marks]

5. Each day 90% of North bikes stay North; 40% of South bikes move North. [5 marks]

(a) Write the North,South column-stochastic matrix. [2 marks]

(b) Predict tomorrow from $(20, 30)$. [3 marks]

6. A forecast is $(34.6, 15.4)$ for 50 bikes. Explain its meaning. [3 marks]