Applied Matrix Theory
Instructional Focus: Markov Chains

CCSS	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Creating and interpreting Markov chains (A.REI.8)	Can extend thinking beyond the standard, including tasks that may involve one of the following: • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving	Create a transition matrix and distribution vector <u>from context</u> Find and <u>interpret</u> the steady state distribution, distribution after n transitions (regular or absorbing), <u>and</u> probability of being absorbed	Create a transition matrix and distribution vector <u>from context</u> Find the steady state distribution <u>or</u> the distribution after n transitions	Create a transition matrix <u>from a diagram</u> Classify given matrices by type	Little evidence of reasoning or application to solve the problem Does not meet the criteria in a level 1

A.REI.8   Represent a system of linear equations as a single matrix equation in a vector variable.

Applied Matrix Theory
Instructional Focus: Game Theory

CCSS	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Creating and analyzing matrices in Game Theory (S.MD.5, S.MD.6, S.MD.7)	Can extend thinking beyond the standard, including tasks that may involve one of the following: • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving	For zero sum games including **at least two** options **without a saddle point** • Create a payoff matrix • Find the mixed strategy (probability distributions) for each player • Find the expected value of the game	For zero sum games including two options with **more than one** saddle point • Create a payoff matrix • Find the **mixed strategy** (probability distributions) for each player • Find the expected value of the game	For zero sum games including two options with **a** saddle point • Create a payoff matrix • Find the strategy (probability distributions) for each player • Find the expected value of the game	Little evidence of reasoning or application to solve the problem Does not meet the criteria in a level 1

S.MD.5   Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.

S.MD.6   Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).

S.MD.7   Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).