

ADVANCED Mathematical Decision Making – AMDM POWER STANDARDS

Unit 1 ANALYZING NUMERICAL DATA

MAMDMN1. Students will extend the understanding of proportional reasoning, ratios, rates, and percents by applying them to various settings to include business, media, and consumerism.

- a. Use proportional reasoning to solve problems involving ratios.
- b. Understand and use averages, weighted averages, and indices.
- c. Solve problems involving large quantities that are not easily measured.
- d. Understand how identification numbers, such as UPCs, are created and verified

Unit 2 PROBABILITY

MAMDMD1. Students will determine probability and expected value to inform everyday decision making.

- a. Determine conditional probabilities and probabilities of compound events to make decisions in problem situations.
- b. Use probabilities to make and justify decisions about risks in everyday life.
- c. Calculate expected value to analyze mathematical fairness, payoff, and risk.

Unit 3 STATISTICAL STUDIES

MAMDMD2. Students will build the skills and vocabulary necessary to analyze and critique reported statistical information, summaries, and graphical displays.

MAMDMD3. Students will apply statistical methods to design, conduct, and analyze statistical studies.

Unit 4 QUANTITATIVE REASONING

MAMDMD4. Students will use functions to model problem situations in both discrete and continuous relationships.

MAMDMD2. Students will solve geometric problems involving inaccessible distances using basic trigonometric principles, including the Law of Sines and the Law of Cosines.

Unit 5 USING FUNCTIONS IN MODELS AND DECISION MAKING

MAMDMD4. Students will use functions to model problem situations in both discrete and continuous relationships.

- a. Determine whether a problem situation involving two quantities is best modeled by a discrete (pattern identification, population growth, compound interest) or continuous (medication dosage, climate change, bone decay) relationship.
- b. Use linear, exponential, logistic, piecewise and sine functions to construct a model

Unit 6 DECISION MAKING IN FINANCE

MAMDMA3. Students will create and analyze mathematical models to make decisions related to earning, investing, spending, and borrowing money.

- a. Use exponential functions to model change in a variety of financial situations.
- b. Determine, represent, and analyze mathematical models for income, expenditures, and various types of loans and investments.

Unit 7 NETWORKS AND GRAPHS

MAMDMA2. Students will use a variety of network models to organize data in quantitative situations, make informed decisions, and solve problems.

- a. Solve problems represented by a vertex-edge graph, and find critical paths, Euler paths, and minimal spanning trees.
- b. Construct, analyze, and interpret flow charts to develop an algorithm to describe processes such as quality control procedures.
- c. Investigate the scheduling of projects using PERT.
- d. Consider problems that can be resolved by coloring graphs.