Advanced Quantitative Reasoning

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I. Numerical Reasoning

1. Using Numbers Everywhere
2. Using Problem-Solving Strategies
3. Using Percent, Sequences, and Recursion
4. Using Ratios, Rates, and Proportion
5. Using Averages, Weighted Averages, and Indices
6. Using Codes, Identification Numbers, and Check Digits
7. Using Large and Small Numbers, Logarithms, and Orders of Magnitude
8. Using Matrices and Matrix Operations
9. Using Counting Principles, Permutations, and Combinations
10. Reasoning With Probability
11. Using Expected Values and Odds
12. Conducting a Numerical Reasoning Project

II. Statistical Reasoning

13. Making Sense of Statistical Information
14. Designing a Statistical Study
15. Using Graphical Displays to Make Informed Decisions
16. Using Summary Statistics to Make Informed Decisions
17. Using the Normal Distribution to Make Informed Decisions
18. Using and Misusing the Tools and Methods of Statistics
19. Conducting a Statistical Study

III. Modeling Using Discrete and Continuous Functions

20. Using Sequences and Series
21. Using Linear Difference Equations
22. Using Proportional Models
23. Using Linear Functions and Correlation
24. Using Piecewise-Linear and Step Functions
25. Using Power Functions
26. Using Exponential and Logistic Functions
27. Using Logarithms and Re-Expressing Data
28. Using Periodic Models and Sinusoidal Functions
29. Using Quadratic and Other Polynomial Functions
30. Conducting a Modeling Project

IV. Geometric Modeling and Spatial Reasoning

31. Modeling Three-Dimensional Objects
32. Using Basic Trigonometry in Two and Three Dimensions
33. Using Three-Dimensional Vectors to Represent and Solve Problems
34. Representing Functions of More Than One Variable
35. Using Vertex-Edge Graphs
36. Using Matrices to Represent Graphs and Directed Graphs
37. Using Geometric Transformations and Symmetry
38. Finding Your Way Around a Sphere
39. Finding Distances and Areas on a Sphere
40. Using Fractals: The Geometry of Fractional Dimensions
41. Conducting a Project Using Geometric Modeling and Spatial Reasoning

V. Final Project

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