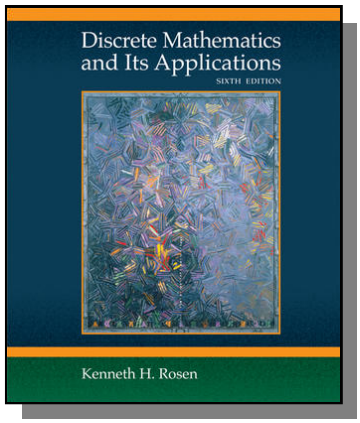
Glencoe

Mississippi
Mathematics Frameworks
Discrete Mathematics



Discrete Mathematics and Its Applications

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Competencies and Objectives	Page References
NUMBER AND OPERATIONS	
1. Explore relationships among number systems.	
a. Use matrices to model and solve problems. (DOK 2)	SE: 246-254
b. Model relationships and solve problems using Graph Theory. (DOK 2)	SE: 647-655, 657-665, 695-707
ALGEBRA	
2. Use algebraic methods to represent simple and complex relationships among statements. Use models to represent patterns and operations.	
a. Define sentence (proposition), and use logic to determine if the sentence is true or false. (DOK 2)	SE: 1-16, 63-72
b. Define simple compound statements: negation, conjunction, disjunction, contradiction, and tautology using truth tables. (DOK 2)	SE: 1-16
c. Define a conditional statement using truth tables. (DOK 2)	SE: 21-27
d. Apply the principles of logic to determine the validity of arguments. (DOK 3)	SE: 30-46, 50-58
e. Define a sequence recursively and explicitly. (DOK 2)	SE: 149-160
f. Find the explicit formula for a recursively-defined sequence using iteration. (DOK 2)	SE: 149-160
g. Use mathematical induction to verify explicit formulas for arithmetic, geometric, and other sequences and/or series. (DOK 2)	SE: 263-279
h. Add, subtract, multiply, and divide sets and find unions, intersections, differences, and complements of sets. (DOK 2)	SE: 111-119, 122-130
GEOMETRY	
3. Use geometric models to describe and analyze mathematical relationships, establish the validity of conjectures, and determine solutions to real applications.	

Competencies and Objectives	Page References
a. Construct a logic circuit from a Boolean expression to determine output. (DOK 2)	SE: 760-765
b. Construct a Boolean expression given a logic circuit. (DOK 2)	SE: 749-755
c. Construct a logic circuit and Boolean expression given an input/output table. (DOK 2)	SE: 757-759
d. Use Venn diagrams to represent basic operations on sets. (DOK 1)	SE: 113, 122-123, 126-128
e. Determine the number of vertices and edges as well as walks, paths, and circuits in a graph. (DOK 2)	SE: 597-608
f. Construct walks, paths, and circuits given an edge/vertex string. (DOK 2)	SE: 612-618
g. Determine whether Euler and Hamiltonial (Hamiltonian) circuits exist in a given graph. (DOK 2)	SE: 633-643
h. Construct a graph given the adjacency matrix of the graph and vice versa. (DOK 1)	SE: 612-618
i. Determine connectivity of a graph using an adjacency matrix. (DOK 1)	SE: 621-628
j. Determine the number of walks between two vertices using powers of the adjacency matrix. (DOK 2)	SE: 628-629
k. Explain why a graph is a tree. (DOK 2)	SE: 683-685
l. Determine the level, parent, siblings, ancestors, descendants and height of a rooted tree. (DOK 1)	SE: 685-693, 710-722
m. Determine the shortest route in a spanning tree. (DOK 2)	SE: 724-734, 737-741
DATA ANALYSIS & PROBABILITY	
4. Investigate and explain strategies for solving simple games.	
a. Determine the characteristics that result in a fair game. (DOK 2)	SE: 447
b. Identify winning strategies for basic games. (DOK 3)	SE: 91-92, 704-707
c. Create and use simulations for probability models. (DOK 3)	SE: 446
d. Solve problems using discrete random variables. (DOK 2)	SE: 400-414, 426-429