

Book: Kenneth Rosen Discrete Math and its applications 7 th ed				
Week	Topic	Pages to read	Topics covered	Exercises
1	Sets	115-118	the definition of a set; elements of a set; cardinality of a set; listing method; set builder method; subsets of a set; and powersets.	1 to 12 on p.125 and 18 to 35 on p.126.
2		127-135	set operations; membership tables; Venn diagrams; the complement of a set; De Morgan's laws; and set properties.	p.136: 1 to 4; 12 to 15; 18 to 24; 27 to 29; 34, 40; and 52 to 54.
3	Functions	138-151	the definition of a function; the domain and co-domain; the range; injection (one-to-one); surjection (onto); and plotting functions.	1 to 6 on p.152; 10 to 17 on p.153; and 62 to 67 on p.155.
4		138-151	function composition; bijections; and the floor and ceiling functions.	8, 9 and 22 to 28 on p.153; 34 to 38 on p.154; and 73 to 76 on p.155.
5	Propositional logic	1-6	the definition of a proposition; truth tables and truth sets; and compound propositions.	p.13: 1 to 6 and 8 to 11.
6		6-12	logical implication; converse, contrapositive and inverse; equivalence; the laws of propositional logic (including De Morgan's laws); and the precedence of logical operators.	12 to 14 on p.13; 15 to 18 on p.14; 25 to 27; and 30 to 33 on p.15.
7	Predicate logic	36-64	the definition of predicates; quantifiers; logical operators; and nested quantifiers.	1 to 10 on p.53 and 20 to 26 on p.54.
8		69-78	De Morgan's laws; rules of inference; and rules of inference with quantifiers.	1 to 5 on p.78; 10 to 13 on p.79; and 20 to 25 on p.80.
9	Boolean Algebra	811-821	the definition of Boolean algebra; Huntington's postulates; De Morgan's theorems; the principle of duality; and algebraic forms.	1 to 5 on p.818; 20 to 25 on p.818; and 35 to 40 on p.819.
10		822-841	the definition of a gate and a circuit; writing Boolean expressions; and circuit simplification (including algebraic and Karnaugh maps).	1 to 10 on pp.827-828, 1 to 5 on p.841.
11	Induction & Recursion	311-341	the definition of mathematical induction; the structure of induction; examples of correct and mistaken proofs by induction; the definition and examples of strong induction; and the definition and examples of the well-ordering property.	3 to 8 on p.329; 39 to 41 on p.331; and 25 to 29 on p.343.
12		344-370	the definition of recursion; recursively defined functions; recursively defined sets; and recursively defined algorithms and examples.	1 to 5 on p.357 and 6 to 11 on p.370.
13	Graphs	641-649; 651-655; 678-682; and 693-703	the definition and application of a graph; degree sequence; simple, regular and complete graphs; and paths.	1 to 12 on p.650; 1 to 6 and 10 to 12 on p.665; 1 to 5 on p.689; and 1 to 8 on p.704.
14		656-661, 668-675 and 707-716	isomorphic graphs, bipartite graphs and Dijkstra's algorithm.	1 to 15 on p.675, 20 to 32 on p.666 and 1 to 10 on p.689.
15	Trees	745-755, 785-790 and 797-802	the definition of a tree; spanning trees; minimum spanning trees; and Prim's and Kruskal's algorithms.	1 to 13 on p.756; 1, 3, 4, 5, 7, 8, 11 and 12 on p.795; and 1 to 10 on p.802.
16		747-760	rooted trees and binary search trees.	1, 2, 3, 4, 5, 16 and 17.
17	Relations	573-583 and 591-606	the definition of a relation; the graph and matrix representation of a relation; and the following relation properties: reflexivity, symmetry, anti-symmetry and transitivity.	1 to 5 and 7 to 25 on pp.581-583; 1 to 10 on pp.596-597; and 1 to 5 on p.606.
18		607-222	equivalence relations; equivalence classes; and partial and total orders.	1, 2, 4, 8, 15, 16, 21, 22, 23, 24, 25 on p.615 and 1, 2, 8, 9 and 10 on p.630.
19	Combinatorics	385-415	the basic counting principles; complex counting problems; the pigeonhole principle; the generalised pigeonhole principle; permutations and combinations; examples of strong induction; and the definition and examples of the well-ordering property.	1 to 5 on p.396; 10 to 15 on p.413; and 21 to 24 on p.414.
20		415-431	binomial coefficients and identities; Pascal's identity and triangle; and generalised permutations and combinations.	4 to 9 on p.421; 13 to 16 on p.421; 5 to 10 on p.432; and 30 to 33 on p.433.