Math 30710 Assignments, Fall 2020

Reading should be completed **before** class on the given date.

Be careful to justify your solution when a homework problem calls for it. Assignments are due on FRIDAYS unless otherwise specified. As long as we are meeting in the classroom, physical assignments will be collected in class. If we have to go online, instructions will be given at that time for turning in your work.

Date	Section/Topic	Reading (page numbers)	Problems	Due
8/10/20	0. Sets and relations	1–8	§0: #3, 5, 7, 11, 12, 13, 15, 16, 17, 25, 28, 31, 32	8/21/20
8/12/20	1. Introduction	11–18	§1: #3, 7, 11, 13, 19, 23, 29, 33, 35, 37, 39, 40	8/21/20
8/14/20	2. Binary operations	20–25	§2: #2–8,, 12, 14–18, 23, 24	8/21/20
8/17/20	3. Isomorphisms	28–34	§3: #1, 2–4, 6–7, 17, 20–23, 26–29	8/28/20
8/19/20	4. Groups	36–43	§4: #1–3, 7, 10, 11–13, 19, 22, 23, 25	8/28/20
8/21/20	4/5. Groups/subgroups	43–45, 49–52	§4: #26–28, 31–33; §5: 1, 2, 5, 11–12, 14	8/28/20
8/24/20	5. Subgroups	53–55	§5: #20, 22, 23, 26, 36, 39, 42, 44, 53, 54	9/4/20
8/26/20	6. Cyclic groups	59–65	§6: #1, 5, 11, 14, 15, 17, 20, 21, 22, 25, 30, 31, 32	9/4/20
8/28/20 - 9/2/20	6. Cyclic Groups		§6: #36, 37, 38, 42, 44, 49;	9/4/20
9/4/20	7. Generators and Cayley digraphs	68–72	§7: #1, 6, 7, 9, 10, 16, 17, 18, 19 (Hint: see #9)	9/11/20
9/7/20	8. Permutation groups	75–81	§8: #1, 5, 6, 8, 10, 11, 17, 18, 23, 24	9/11/20
9/9/20	8. Permutation groups, Cayley's theorem	81–83	§8: #30, 31, 35, 39, 41, 43, 47	9/11/20
9/11/20	Proof of Cayley's theorem, then start §9: Orbits, cycles, even and odd permutations, alternating groups	87–93		
9/14/20	9. Orbits, cycles, even and odd permutations, alternating groups	87–93	§9: #1, 6, 7, 10, 13, 14, 15, 19–23, 29, 34	9/25/20
9/16/20	Review			
9/18/20	Exam 1	Includes all material in sections 1–8.		
9/21/20	10. Cosets	96–100	§10: #1–4, 6–7, 12, 13, 15, 19, 20–24	10/2/20
9/23/20	10 Lagrange's Theorem	100–101	§10: #27, 30–34, 37, 41, 43	10/2/20
9/25/20	11. Products	104–110	Get started on §11 HW	
9/28-30/20	11. Finite abelian groups	104–110	§11: #1, 2, 7, 8, 9, 13, 14, 18, 20, 24, 32, 36, 46, 47	10/2/20
10/2/20	13. Homomorphisms	125–129	§13: #1–5, 9, 10, 16, 17, 22, 24, 25, 28, 29	10/9/20
10/5/20	13. Homomorphisms	129–133	§13: #32, 33, 34, 39, 42, 47, 48, 49, 52	10/9/20
10/7/20	14. Factor groups	135–139	§14: #1–2, 7, 9–10	10/16/20

10/9/20	14. Factor groups	139–141	§14: #17, 18, 20, 23a-d, 24, 30	10/16/20
10/12/20	14. Factor groups - summary	135–141		
10/14/20	15. Factor groups/Simple groups	144–148	§15: #1–5, 19, 28	Not collected but on exam
10/16/20	15. Factor groups/Simple groups	149–151	§15: #30, 31, 34	Not collected but on exam
10/19/20	18. Rings and Fields	167–170	§18: #3, 5, 7, 9, 11, 14, 15, 16, 17, 19	10/30/20
10/21/20	Review			
10/23/20	Exam 2	Covers §§9, 10, 11, 13, 14, 15		
10/26/20	18. Rings and Fields	171–174	§18: #20, 22, 23, 24, 25, 27, 28, 33, 37, 38	10/30/20
10/28/20	24/19 Quaternions/Domains	177–179, 224–226	§19: #1–4, §24: 4–7	11/6/20
10/30/20, 11/2/20	19. Domains	177–182	§19: #5, 7, 9, 11, 12, 14, 15–18, 23, 29	11/6/20
11/4/20	20. Fermat's and Euler's theorems	184–189	§20: #1–10	11/11/20
	20. Fermat's and Euler's theorems (cont.)			
	21. Field of Quotients	190–196	§21: #1, 2, 4, 5, 6–11	
11/06/20	22. Polynomials	198–207	§22: #1, 2, 6, 7, 9, 13, 17, 22, 23, 25	11/11/20
	23. Factorization	209–214	§23: #2, 4, 6, 8, 9, 11, 13	
	23. Factorization (cont.); 26. Ideals	209–218	§23: #14, 16, 18, 20, 21, 25, 26, 27, 28	
	26. Ideals, Factor rings	237–243	§26: #3, 4, 17	
	Factor rings, finite fields			
	Applications to geometry			
	29. Field extensions, 31:Algebraic extensions	265–272, 283–286	§29: #1, 3, 9, 10, 11, 13 31: 1–6	
	32. Geometric constructions	293–299		