

MATH 220 - Fall 2026 Monthly Calendar

September 2026

Mathematical Reasoning and Proof • Classes M/W/F • Homework due Fridays at 10:00 a.m. on Gradescope • Weekly quiz Mondays

Office hours - Seeley Mudd 302: Mon 2:30-3:30 Wed 2:30-3:30 Thu 1:30-3:30

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1		1 X	2 Why rigor and proof? Inductive vs deductive reasoning; “even plus even is even”; template for direct proofs Office Hours 2:30-3:30 - Seeley Mudd 302	3 Office Hours 1:30-3:30 - Seeley Mudd 302	4 Logic Statements, operations negations, implications Homework 1 due - 10:00 a.m.
Week 2	7 Quiz 1 Truth tables and Boolean identities Converse, contrapositive, counterexamples Office Hours 2:30-3:30 - Seeley Mudd 302	8 X	9 Direct proofs with divisibility Additivity, transitivity, signs; factorization Office Hours 2:30-3:30 - Seeley Mudd 302	10 Office Hours 1:30-3:30 - Seeley Mudd 302	11 Proof by cases Disproofs, parity, division algorithm Homework 2 due - 10:00 a.m.
Week 3	14 Quiz 2 Direct proofs with inequalities Definitions, quantifiers, proof setup Office Hours 2:30-3:30 - Seeley Mudd 302	15 X	16 More inequalities and casework Factorization; Fermat-number examples Office Hours 2:30-3:30 - Seeley Mudd 302	17 Office Hours 1:30-3:30 - Seeley Mudd 302	18 Begin proof by contradiction Rationals / irrationals; $\sqrt{2}$; primes Homework 3 due - 10:00 a.m.
Week 4	21 Quiz 3 Contradiction and contrapositive Rational + irrational; no-solution arguments Office Hours 2:30-3:30 - Seeley Mudd 302	22 X	23 More contradiction Logarithms and integer equations Office Hours 2:30-3:30 - Seeley Mudd 302	24 Office Hours 1:30-3:30 - Seeley Mudd 302	25 Contradiction workshop Begin induction: base case and step Homework 4 due - 10:00 a.m.
Week 5	28 Quiz 4 Induction template and variants Starting values; even integers; geometric series Office Hours 2:30-3:30 - Seeley Mudd 302	29 X	30 Induction examples Recursive sequences, sums, Fibonacci Office Hours 2:30-3:30 - Seeley Mudd 302		

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October 2026

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 5				1 Office Hours 1:30-3:30 - Seeley Mudd 302	2 Induction workshop + catch-up Midterm 1 review Homework 5 due - 10:00 a.m.
Week 6	5 Quiz 5 Midterm 1 review Definitions and proof techniques; Assignments 1-5 Office Hours 2:30-3:30 - Seeley Mudd 302	6 	7 Midterm 1 Logic, direct proofs, cases, contradiction, induction Office Hours 2:30-3:30 - Seeley Mudd 302	8 Office Hours 1:30-3:30 - Seeley Mudd 302	9 Sets Notation, set-builder, elements vs subsets; empty sets
Week 7	12 <i>Holiday - no class</i>	13 	14 Subsets and equality Element-chasing proofs; counterexamples; $\emptyset \subseteq S$ Office Hours 2:30-3:30 - Seeley Mudd 302	15 Office Hours 1:30-3:30 - Seeley Mudd 302	16 Set operations Union, intersection, difference, complement Homework 6 due - 10:00 a.m.
Week 8	19 Quiz 6 De Morgan's laws and set identities Prove / disprove inclusions and equalities Office Hours 2:30-3:30 - Seeley Mudd 302	20 	21 Power sets and Cartesian products Elements vs subsets; begin functions Office Hours 2:30-3:30 - Seeley Mudd 302	22 Office Hours 1:30-3:30 - Seeley Mudd 302	23 Functions between arbitrary sets Domain, codomain, images, surjectivity Homework 7 due - 10:00 a.m.
Week 9	26 Quiz 7 Well-defined functions Function spaces; images of subsets Office Hours 2:30-3:30 - Seeley Mudd 302	27 	28 Surjectivity and image proofs Unions/intersections; counterexamples; IVT example Office Hours 2:30-3:30 - Seeley Mudd 302	29 Office Hours 1:30-3:30 - Seeley Mudd 302	30 More image identities Begin inverse images / preimages Homework 8 due - 10:00 a.m.

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November 2026

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Office hours - Seeley Mudd 302: Mon 2:30-3:30 Wed 2:30-3:30 Thu 1:30-3:30

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 10	2 Quiz 8 Preimages Definition, membership criterion, examples Office Hours 2:30-3:30 - Seeley Mudd 302	3	4 Preimage identities $f^{-1}(f(S)), f(f^{-1}(T))$; begin injectivity Office Hours 2:30-3:30 - Seeley Mudd 302	5 Office Hours 1:30-3:30 - Seeley Mudd 302	6 Injectivity Definition, negation, contrapositive; horizontal-line test Homework 9 due - 10:00 a.m.
Week 11	9 Quiz 9 More injectivity Monotonicity; restricted domains; image/preimage identities Office Hours 2:30-3:30 - Seeley Mudd 302	10	11 Midterm 2 Sets, functions, images, preimages, surjectivity, injectivity Office Hours 2:30-3:30 - Seeley Mudd 302	12 Office Hours 1:30-3:30 - Seeley Mudd 302	13 Composition Domain/codomain compatibility; order matters
Week 12	16 Quiz 10 Composition Associativity, identities; injective/surjective results Office Hours 2:30-3:30 - Seeley Mudd 302	17	18 Composition workshop Begin inverse functions; invertible iff bijective Office Hours 2:30-3:30 - Seeley Mudd 302	19 Office Hours 1:30-3:30 - Seeley Mudd 302	20 Computing and verifying inverses Domain restrictions; inverse notation Homework 10 due - 10:00 a.m.
Week 13	23 Holiday - no class	24	25 Holiday - no class	26 Holiday - no office hours	27 Holiday - no class
Week 14	30 Quiz 11 More inverses Polynomial, rational, $\mathbb{R}^2$ examples; left/right inverses Office Hours 2:30-3:30 - Seeley Mudd 302				

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December 2026

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Office hours - Seeley Mudd 302: Mon 2:30-3:30 Wed 2:30-3:30 Thu 1:30-3:30

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 14		1 X	2 Inverse-function proofs Cancellation and uniqueness Office Hours 2:30-3:30 - Seeley Mudd 302	3 Office Hours 1:30-3:30 - Seeley Mudd 302	4 Relations Subsets of $S \times S$; reflexive, symmetric, transitive; equivalence Homework 11 due - 10:00 a.m.
Week 15	7 Quiz 12 Equivalence and partitions Modular equivalence; begin cardinality Office Hours 2:30-3:30 - Seeley Mudd 302	8 X	9 Same size via bijections Finite cardinality; countable sets; Hilbert's Hotel Countability and uncountability Count $\mathbb{Z}$, $\mathbb{Q}$; Cantor diagonalization; power sets Homework 12 due - final-week exception Office Hours 2:30-3:30 - Seeley Mudd 302	10	11
	14	15 X	16	17	18
	21	22 X	23	24	25
	28	29 X	30	31	