Directions

Each class, in which we don't have an exam, you will have a quiz with three questions; two definitions and one exercise. The questions will be based on material which we have covered from any of the unit study guides. The quizzes can't count against your grade but they can count for your grade; all the quizzes together can count for up to one full exam grade.
The objective of these quizzes is to:

1. help you raise your exam grades in the same way a make-up exam would,
2. keep you on top of the material by encouraging you to study between classes,
3. encourage you to review older material so that you are better prepared for the final, and
4. re-enforce previous concepts in support of learning newer material.

Below is a copy of all the content from the exam study guides; these have been online all semester. Material which has been covered as of *3-26-2023* is checked off and in green. As we cover additional material *you are responsible for checking it off*.

Practice Exercises Checklist

Look at the A-Type Exercises in the sections (just look at the odd ones that have answers in the back of the book):

✔ 1.3	✔ 3.2	✔ 4.2	✔ 4.5	✔ 5.3	✔ 7.1	☐ 7.4	☐ 8.3
✔ 2.3	✔ 3.3	✔ 4.3	✔ 5.1	✔ 6.1	☐ 7.2	☐ 8.1	
✔ 3.1	✔ 4.1	✔ 4.4	✔ 5.2	✔ 6.2	☐ 7.3	☐ 8.2	☐ 8.4

Definitions Check List

Given the start of any one of these definitions you should be able to complete the rest of the definition.

- ✔ Ring
- ✔ Field
- ✔ Integral Domain
- ✔ Ring Homomorphism
- ✔ Ring Isomorphism
- ✔ Equivalence Relation
- ✔ Equivalence Class
- ✔ Reflexive
- ✔ Symmetric
- ✔ Transitive
- ✔ Modular Equivalence
- ✔ Divisible
- ✔ Surjective (onto)
- ✔ Injective (1-1)
- ✔ Divisibility for Polynomials
- ✔ Polynomial Rings
- ✔ Quotient Ring
- ✔ Polynomial
- ✔ Kernel
- ✔ Reducible Polynomial Over a Field
- ✔ Irreducible Polynomial Over a Field
- ✔ Equivalence Relation

- ✔ Equivalence Class
- ✔ Ideal in a Ring
- ✔ Group
- ✔ Dihedral Group
- ☐ Symmetric Group
- ☐ Subgroup
- ☐ Order of a Group
- ☐ Order of an Element
- ☐ Cyclic Group
- ☐ Abelian Group
- ☐ Group Homomorphism
- ☐ Group Isomorphism
- ☐ Center of a Group
- ☐ Normal Subgroups
- ☐ Cosets
- ☐ Congruence Modulo a Subgroup
- ☐ Quotient Groups
- ☐ Index of a Subgroup
- ☐ Quotient Structure

Theorems Checklist

These theorems represent the most significant results from this semester. You should be able to understand these and use them to complete exercises.

- ✔ Bezout's Theorem: If a and b are integers, then there exist integers m and n such that $ma + nb = (a, b)$.
- ✔ Theorem: If R is a finite ring, then every non-zero element of R is either a zero divisor or unit.
- ✔ Theorems 3.3, 3.4, and 3.5: Basic Properties of Rings
- ✔ Theorem 3.6: On Subrings
- ✔ Theorem 3.9: All finite integral domains are fields.
- ✔ Theorem 3.10 and Corollary 3.11: Properties of Homomorphisms and Isomorphisms
- ✔ Theorem 4.1 (p.86): Basic Properties of $R[x]$
- ✔ Theorem 4.2/Corollary 4.4 (p.89): $deg(f \cdot g) \leq deg(f) + deg(g)$ with equality if the ring is an integral domain.
- ✔ Theorem 4.6 (p.91): Division Algorithm
- ✔ Theorem 4.15 (p. 107): Remainder Theorem
- ✔ Theorem 4.16 (p.107): Factor Theorem
- ✔ Theorem 4.24 (p.116): Eisenstein's Criterion
- ✔ Theorem 4.26 (p.120): Fundamental Theorem of Algebra
- ✔ Theorem 5.10 (p.135): A polynomial $p(x) \in F[x]$ is irreducible if and only if $F[x]/p(x)$ is a field.
- ✔ Theorem 6.13 (p.157): First Isomorphism Theorem
- ☐ Theorem 7.5 (and corollary 7.6, p. 196): On Identity, Inverses, and Cancellation

- ☐ Theorem 7.9 (p. 200): On Orders
- ☐ Theorem 7.11 & 7.12 (p.204-205): Identifying Subgroups
- ☐ Theorem 7.19 (p.219): Cyclic Groups
- ☐ Theorem 7.21 (p.221): Cayley's Theorem,
- ☐ Theorem 8.5 (p.241): Lagrange's Theorem,
- ☐ Theorem 8.7 (p.242): Groups of Prime Order
- ☐ Theorem 8.13 (p.255): Quotient Groups
- ☐ Theorem 8.16 (p.264): The Kernel is a Normal Subgroup
- ☐ Theorem 8.20 (p.266): First Isomorphism Theorem (for groups)