

EUCLIDEAN AND NON-EUCLIDEAN GEOMETRY
MATH 3210

HOMEWORK 3

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1. EXERCISES

In addition to

- Chapter 1, Exercises: 14, 15,
- Chapter 2, Exercises: 1, 2, 3,

please do the following:

Exercise A. Write the negation of the following statements.

- (1) An invertible matrix has a non-zero determinant.
- (2) Six is prime or seven is odd.
- (3) x is in A or x is not in B .

Exercise B. Construct a truth table for each of the following statements.

- (1) $p \implies \sim q$
- (2) $[p \wedge (p \implies q)] \implies q$
- (3) $[p \implies (q \wedge \sim q)] \iff \sim p$.

Exercise C. Use a truth table to verify that each of the following is a tautology.

- (1) $[p \wedge (q \vee r)] \iff [(p \wedge q) \vee (p \wedge r)]$
- (2) $[p \vee (q \wedge r)] \iff [(p \vee q) \wedge (p \vee r)]$

Exercise D. Write the negation of each statement.

- (1) Some pencils are red.
- (2) $\exists y \in B$ s.t. $f(y) > k$.
- (3) If $x \in A$, then $\exists y \in B$ s.t. $f(x) < f(y)$.