

Decision Procedures for Verification

HOMEWORK 1

Problem 1

- (a) How many propositional formulas can you write using only the three propositional letters p, q, r ?
- (b) How many *nonequivalent* propositional formulas can you write using only the three propositional letters p, q, r ?

Problem 2

Convert the following formulas to CNF/DNF using the standard equivalence-preserving conversion method.

- (a) $(p \rightarrow q) \leftrightarrow r$
- (b) $(\neg p \rightarrow q) \wedge ((p \wedge r) \leftrightarrow q)$
- (c) $\neg(p \wedge (q \vee \neg r \vee s))$

Problem 3

- (a) Show how to use truth-tables in order to convert a propositional formula into a DNF.
- (b) Show that truth tables can also be used to convert propositional formulas to CNFs.