Discrete Structure I   **Due date:** None
HW #2

1. We consider the following truth table for a formula φ:

p	q	r	s	φ
T	T	T	T	T
T	T	T	F	F
T	T	F	T	T
T	T	F	F	F
T	F	T	T	F
T	F	T	F	T
T	F	F	T	F
T	F	F	F	T
F	T	T	T	T
F	T	T	F	F
F	T	F	T	T
F	T	F	F	F
F	F	T	T	F
F	F	T	F	T
F	F	F	T	F
F	F	F	F	T

(a) Using Karnaugh maps, find a DNF and a CNF for φ.

(b) Now we define the connective *nor* by: $p \ nor \ q = \neg(p \lor q)$. Prove that the set $\{nor\}$ is adequate.

(c) Deduce a representation for φ by only the *nor* connective.