2.4.28 a. $(p \wedge q) \vee (p \wedge \sim q) \vee (\sim p \wedge \sim q)$ b. $(p \vee \sim q)$

$(p \wedge q) \vee (p \wedge \sim q) \vee (\sim p \wedge \sim q)$

$= (p \wedge (q \vee \sim q)) \vee (\sim p \wedge \sim q)$ Distributive

$= p \vee (\sim p \wedge \sim q)$ Negation

$= p \vee \sim (p \vee q)$ De Morgan's

$= p \vee \sim q$

Discrete Structures

Josiah Schmitz

HW #2

9/14/23

2.1.10 b. $p \wedge \sim q$ d. $\sim p \wedge q \wedge \sim r$ e. $\sim p \vee (q \wedge r)$

2.1.22

p q r	q v r	p ∧ q	p ∧ r	p ∧ (q v r)	(p ∧ q) v (p ∧ r)
T T T	T	T	T	T	T
T T F	T	T	F	T	T
T F T	T	F	T	T	T
T F F	F	F	F	F	F
F T T	T	F	F	F	F
F T F	T	F	F	F	F
F F T	T	F	F	F	F
F F F	F	F	F	F	F

They are logically equivalent because $p \wedge (q \vee r)$ and $(p \wedge q) \vee ($
have the same truth values.

2.4.4 S = 1

2.4.21 a. $(p \wedge q) \vee (q \wedge r) \vee (\sim p \wedge \sim r)$

b.