

CW OLA solutions

1. a) $\neg h \rightarrow w \wedge m$

b) $m \rightarrow w \wedge \neg h$

2. converse: if I stay home,
then it rains today.

inverse: if it doesn't rain today,
then I will not stay home.

contrapositive: if I don't stay home,
then it doesn't rain today.

3. $(p \oplus q) \wedge (q \oplus r)$

p	q	r	$(p \oplus q)$	\wedge	$(q \oplus r)$
T	T	T	F	F	F
T	T	F	F	F	T
T	F	T	T	T	T
T	F	F	T	F	F
F	T	T	T	F	F
F	T	F	T	T	T
F	F	T	F	F	T
F	F	F	F	F	F

4. $(p \wedge \neg q \wedge r) \vee (\neg p \wedge q \wedge \neg r)$

CW OLB solutions

1. a) $\neg w \wedge p \rightarrow s$

b) $p \rightarrow s \wedge w$

2. converse: if I go out to eat,
then it is my birthday.

inverse: if it is not my birthday,
then I do not go out to eat.

contrapositive: if I do not go out to eat,
then it is not my birthday.

3. $(p \leftrightarrow q) \wedge (q \leftrightarrow r)$

p	q	r	$(p \leftrightarrow q)$	\wedge	$(q \leftrightarrow r)$
T	T	T	T	T	T
T	T	F	T	F	F
T	F	T	F	F	F
T	F	F	F	F	T
F	T	T	F	F	T
F	T	F	F	F	F
F	F	T	T	F	F
F	F	F	T	T	T

4. $(p \wedge q \wedge r) \vee (\neg p \wedge \neg q \wedge \neg r)$