

## Answer Key

- 1a. Is a proposition, is true.
- 1b. Is a proposition, is true.
- 1c. Not a proposition - it is a question.
- 1d. Not a proposition - it is an opinion.
- 1e. Not a proposition - because of variables, it is not unambiguously true or false.
- 1f. Is a proposition, is false.
- 2a. true
- 2b. false
- 2c. false
- 2d. false
- 2e. true
- 2f. true
- 2g. true
- 2h. false
- 2i. true
- 2j. false
- 2k. true
- 2l. true
- 3a.  $\neg q$
- 3b.  $\neg p$
- 3c.  $p \wedge q$
- 3d.  $\neg p \wedge \neg q$
- 3e.  $p \vee q$

3f.  $\neg p \wedge q$

3g.  $(p \vee q) \wedge (p \wedge q)$

3h.  $\neg p \wedge \neg q \wedge \neg r$

4a.

$p$	$q$		$\neg q$	$p \wedge \neg q$
T	T		F	F
T	F		T	T
F	T		F	F
F	F		T	F

4b.

$p$	$q$		$\neg p$	$\neg q$	$\neg p \vee \neg q$
T	T		F	F	F
T	F		F	T	T
F	T		T	F	T
F	F		T	T	T

5.

$p$	$q$	$r$
T	T	T
T	T	F
T	F	T
T	F	F
F	T	T
F	T	F
F	F	T
F	F	F

6.

$p$	$q$		$\neg p$	$\neg q$	$(p \vee q)$		$\neg p \wedge \neg q$		$\neg(p \vee q)$
T	T		F	F	T		T		T
T	F		F	T	T		F		F
F	T		T	F	T		F		F
F	F		T	T	F		F		F