Answer Key

1. a. Is a proposition, is true.
   b. Is a proposition, is true.
   c. Not a proposition - it is a question.
   d. Not a proposition - it is an opinion.
   e. Not a proposition - because of variables, it is not unambiguously true or false.
   f. Is a proposition, is false.

2. a. a AND b:

	Compound	Values	Result
a.	$a \wedge b$	$a = true, b = true$	TRUE
b.	$a \wedge b$	$a = true, b = false$	FALSE
c.	$a \wedge b$	$a = false, b = true$	FALSE
d.	$a \wedge b$	$a = false, b = false$	FALSE

   b. a OR b:

	Compound	Values	Result
e.	$a \vee b$	$a = true, b = true$	TRUE
f.	$a \vee b$	$a = true, b = false$	TRUE
g.	$a \vee b$	$a = false, b = true$	TRUE
h.	$a \vee b$	$a = false, b = false$	FALSE

   c. Compound:

	Compound	Values	Result
i.	$a \wedge \neg b$	$a = true, b = false$	TRUE
j.	$a \vee \neg b$	$a = false, b = true$	FALSE
k.	$\neg a \wedge b$	$a = false, b = true$	TRUE
l.	$\neg a \vee b$	$a = false, b = false$	TRUE

3. m: There is milk in the fridge, e: There are eggs in the fridge, c: There is cheese in the fridge.

   a. There is milk in the fridge, or there is cheese in the fridge.
   $m \vee c$

   b. There is milk in the fridge, or there is cheese in the fridge, but not both.
   $(m \vee c) \wedge (\neg m \vee \neg c)$ or
   $(m \vee c) \wedge \neg(m \wedge c)$.

c. There is milk in the fridge but there are no eggs in the fridge.
$m \wedge \neg e$

d. There is milk in the fridge and there is either cheese or eggs in the fridge.
$m \wedge (e \vee c)$

e. There is not milk in the fridge and there is not cheese in the fridge.
$\neg m \wedge \neg c$

f. It is not true that... there is milk or cheese in the fridge.
$\neg(m \vee c)$

g. There is not milk in the fridge or there is not cheese in the fridge.
$\neg m \vee \neg c$

h. It is not true that... there is milk and cheese in the fridge.
$\neg(m \wedge c)$

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