Question #8

1. Ex. 1.5.2, sections c, f, i

c. $(p \to q) \wedge (p \to r) \equiv p \to (q \wedge r)$

$(\neg p \vee q) \wedge (\neg p \vee r)$	[conditional identity]
$\neg p \vee (q \wedge r)$	[distributive law]
$p \to (q \wedge r)$	[conditional identity]

f. $\neg(p \vee (\neg p \wedge q)) \equiv \neg p \wedge \neg q$

$\neg((p \vee \neg p) \wedge (p \vee q))$	[distributive law]
$\neg(T \wedge (p \vee q))$	[complement law]
$\neg((p \vee q) \wedge T)$	[commutative law]
$\neg(p \vee q)$	[Domination Law]
$\neg p \wedge \neg q$	[de Morgan's Law]

i. $(p \wedge q) \to r \equiv (p \wedge \neg r) \to \neg q$

$\neg(p \wedge q) \vee r$	[conditional identity]
$(\neg p \vee \neg q) \vee r$	[de Morgan's Law]