5. Given a set of premises, construct a proof using the rules of inference.

Premise 1: $(a \wedge b) \vee \neg a$

Premise 2: $b \rightarrow c$

Premise 3: $e \leftrightarrow c$

Prove that $a \rightarrow e$

1	$(\neg a \vee a) \wedge (\neg a \vee b)$	Distributive Law applied to Premise 1
2	$T \wedge (\neg a \vee b)$	Trivial tautology in 1
3	$(\neg a \vee b)$	Identity law applied to 2
4	$a \rightarrow b$	Definition of implication
5	$a \rightarrow c$	Hypothetical syllogism of 4 and Premise 2.
6	$(e \rightarrow c) \wedge (c \rightarrow e)$	Definition of $\leftrightarrow$
7	$c \rightarrow e$	Simplification of 6
8	$a \rightarrow e$	Hypothetical syllogism applied to 5 and 7.

Let $A = \{0, 3, 9\}$ and $B=\{-1, 1, 3, 6, 11\}$.

6. a. What is $A \cup B$?

$\{-1, 0, 1, 3, 6, 9, 11\}$

b. What is $A \cap B$?

$\{3\}$

c. Is $(A - B) \supset (B-A)$?

No.

d. Is $B \subseteq (B \cap A)$?

No.