

# MA-236: Homework 4

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I pledge my honor that I have abided by the Stevens Honor System.

"If you play and you study you'll pass the exams, while if you play and don't study you won't pass. Thus, if you play, either you study and you'll pass the exams, or you don't study and you won't pass."

1. Write out the premises and conclusion of the above argument in English.

**Premises:**

- If you play and study you'll pass the exams.
- If you play and don't study you won't pass.

**Conclusion:**

- If you play either you study and you'll pass the exams, or you don't study and you won't pass.

2. Identify and name the atomic sentences.

**A:** You play.

**B:** You study.

**C:** You pass the exams.

3. Write down the symbolic form of the argument.

Premise 1:  $(A \wedge B) \rightarrow C$

Premise 2:  $(A \wedge \neg B) \rightarrow \neg C$

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Conclusion:  $A \rightarrow ((B \wedge C) \vee (\neg B \wedge \neg C))$

4. Check if the argument is valid.

A	B	C	$(A \wedge B) \rightarrow C$	$(A \wedge \neg B) \rightarrow \neg C$	$A \rightarrow ((B \wedge C) \vee (\neg B \wedge \neg C))$
t	t	t	t	t	t
t	t	f	f	t	f
t	f	t	t	f	f
t	f	f	t	t	t
f	t	t	t	t	t
f	t	f	t	t	t
f	f	t	t	t	t
f	f	f	t	t	t

Since there are no counter examples where the premises are all true and the conclusion is false, this is a valid argument.