

You must show your work to get full credit.

1. Negate the following statements.

(a) If I study, then I will get an A.

I study, and do not get an A

or

I study, but do not get an A.

(b) Sally will go running, or she will watch a movie.

Sally does not go running and does not watch a movie

2. Make a truth table to show that

$$(P \wedge \neg P) \rightarrow Q$$

is a tautology.

| P | Q | $\neg P$ | $P \wedge \neg P$ | $(P \wedge \neg P) \rightarrow Q$ |
|---|---|----------|-------------------|-----------------------------------|
| T | T | F        | F                 | T                                 |
| T | F | F        | F                 | T                                 |
| F | T | T        | F                 | T                                 |
| F | F | T        | F                 | T                                 |

It is a tautology because its truth table is all trues.