Propositional Logic

Definition
Translating English

1.1.14 Let $p$, $q$, and $r$ be the propositions

$p$: You get an A on the final exam.
$q$: You do every exercise in this book.
$r$: You get an A in this class.

Write these propositions using $p$, $q$, and $r$ and logical connectives (including negations).

a. You get an A in this class, but you do not do every exercise in this book.

b. You get an A on the final, you do every exercise in this book, and you get an A in this class.

c. To get an A in this class, it is necessary for you to get an A on the final.
Propositional Logic

Translating English

1.1.14 (con’t) Let \( p, q, \) and \( r \) be the propositions
\( p : \) You get an A on the final exam.
\( q : \) You do every exercise in this book.
\( r : \) You get an A in this class.
Write these propositions using \( p, q, \) and \( r \) and logical connectives (including negations).

a. You get an A on the final, but you don't do every exercise in this book; nevertheless, you get an A in this class.

b. Getting an A on the final and doing every exercise in this book is sufficient for getting an A in this class.

c. You will get an A in this class if and only if you either do every exercise in this book or you get an A on the final.
Truth Tables

Construct a truth table for each of these compound propositions.

a \( p \rightarrow \neg p \)
b \( p \leftrightarrow \neg p \)
c \( p \oplus (p \lor q) \)
d \( (p \land q) \rightarrow (p \lor q) \)
e \( (q \rightarrow \neg p) \leftrightarrow (p \leftrightarrow q) \)
f \( (p \leftrightarrow q) \oplus (p \leftrightarrow \neg q) \)