¡Your Name¿
Math 241
Jan 22, 2010

Exercise 4a. *Let p and q be the propositions:*

p : *I bought a lottery ticket this week*

q : *I won the million dollar jackpot on Friday*

Write $\neq p \vee (p \wedge q)$ as an English sentence.

Solution. 4a You type here. □

Exercise 10ad. *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 logical connectives:

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

d 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.

Solution. 10ad You type here □

Exercise 16ad. *For each of these statements determine if an inclusive or or an exclusive or is intended. Justify your answer*

a Experience with C++ or Java is required.

d Publish or perish.

Solution. 16ad You type here □

Exercise 23c. *State the converse, contrapositive and inverse of: "A positive integer is a prime only if it has no divisors other than 1 and itself."*

Solution. 23c You type here □

Exercise 25c. *How many rows appear in a truth table for* $(p \wedge q \wedge t) \leftrightarrow (q \wedge t)$*? What general observation can you make about the number of rows?*

Solution. 25c You type here □

Exercise 27d. *Construct a truth table for* $(p \vee q) \rightarrow (p \wedge q)$

Solution. 27d You type here; figure out how to use the tabular environment. □

Exercise 30f. *Construct a truth table for* $(p \oplus q) \wedge (p \oplus \neq q)$.

Solution. 30f Type here □

Exercise 36. *What is the value of* x *after each of these statements is encountered in a computer program, if* $x = 1$ *before the statement is reached?*

a `if 1+2 = 3 then x:=x+1`

b `if (1+1 =3) OR (2+2=3) then x:=x+1`

c `if (2+3=5) AND (4+3=7) then x:=x+1`

d `if (1+1 =2) XOR (1+2=3) then x:=x+1`

e `if x<2 then x:=x+1`

Solution. 36 Type here □

Exercise 62. *Five friends have access to a chat room. Is it possible to determine who is chatting if the following information is known? Either Kevin or Heather or both are chatting. Either Randy or Vijay but not both are chatting. If Abby is chatting, so is Randy. Vijay and Kevin are either both chatting or neither is. If Heather is chatting then so are Abby and Kevin. Explain your reasoning.*

Solution. 62 Type here □

Exercise 8. *Use DeMorgan's Law to find find the negation of each of the following:*

a Kwame will take a job in industry or go to graduate school.

b Yoshiko knows Java and calculus.

c James is young and strong.

d Rita will move to Oregon or Washington.

Solution. 8 Type here □

Exercise 24. *Show that* $(p \leftarrow q) \vee (p \leftarrow r)$ *and* $(p \vee q) \leftarrow r$ *are logically equivalent.*

Solution. 24 Type here □

Exercise 40. *Find a compound proposition involving* p, q, r *that is true when* p *and* q *are true and* r *is false, but is false otherwise.*

Solution. 40 Type here □