1. Select all the statements in the following list

(1) Be sure to wash your dishes after eating
(2) Will there be tacos for dinner?
(3) There are life forms on Jupiter.
(4) 2 + 4 = 82

(1) No, it is a command, not a proposition
(2) No, it is a question
(3) Yes. It is a proposition.
(4) Yes. It is a proposition.

2. How many rows will be in a truth table of a wff that contains 6 variables?

A. 12
B. 64
C. 32
D. 6

$2^6 = 64$

3. Negate the following:

(1) A $\vee$ B
(2) You did not pass the class and you did not fail.
(3) A $\rightarrow$ B

(1) (A $\vee$ B)' = A' $\wedge$ B'

(2)
A: You did pass the class
B: You did fail the class
A' $\wedge$ B'

(A' $\wedge$ B')' = A $\vee$ B

You did pass the class or you did fail the class

(3) A $\rightarrow$ B
A' $\vee$ B

$(A' \vee B)' = A \wedge B'$

4. Construct the truth tables for the following wffs.

(1) $(A \vee B)'$
(2) $A' \wedge B'$
(3) $(A \rightarrow B) \leftrightarrow (A' \vee B)'$
(4) $A \vee B \leftrightarrow (A' \rightarrow B)$

(1)

A	B	A ∨ B	(A ∨ B)'
T	T	T	F
T	F	T	F
F	T	T	F
F	F	F	T

(2)

A	B	A'	B'	A' ∧ B'
T	T	F	F	F
T	F	F	T	F
F	T	T	F	F
F	F	T	T	T

(3)

A	B	A'	A → B	A' ∨ B	(A' ∨ B)'	A → B ↔ (A' ∨ B)'
T	T	F	T	T	F	F
T	F	F	F	F	T	F
F	T	T	T	T	F	F
F	F	T	T	T	F	F

(4)

A	B	A'	A ∨ B	A' → B	A ∨ B ↔ A' → B
T	T	F	T	T	T
T	F	F	T	T	T
F	T	T	T	T	T
F	F	T	F	F	T

5. List all wff in #4 that are tautologies or contradictions.

(3) is contradition, (4) is tautology

6. List all paris of wffs in #4 that are equivalent

(1) and (2) are equivalent

7. Simplify the Boolean expression in the following piece of code

```
if( !( !(x == 2) || (y < z)) || ( (y<z) && (x == 2) ))
{
z++;
}
```

A: x == 2
B: y < z

(A' ∨ B)' ∨ (B ∧ A)
A ∧ B' ∨ (B ∧ A)
(A ∧ B') ∨ (A ∧ B)
A ∧ (B' ∨ B)
A ∧ 1
A

After the simplification, we got:

```
if(x==2) { z++;

}
```