

Homework 1, Spring 2023

I have neither given nor received unauthorized assistance on this assignment.

Homework 1 has questions 1 through 3 with a total of 15 points. For this assignment, *neatly handwrite* your work on your own paper, digitize it, and upload it to Canvas.

5 1. Define statements A, B, C, D , and E as

- A = The number π is rational.
- B = The integer 4 is even.
- C = We have $3 < \pi$.
- D = The number $\sqrt{2}$ is not rational.
- E = The cosine function is an even function.

Using these statements, write an example of

- (a) a conjunction of two statements that has a truth value of false.
- (b) a conjunction of two statements that has a truth value of true.
- (c) a disjunction of two statements that has a truth value of true.
- (d) a disjunction of two statements that has a truth value of false.
- (e) a conditional statement with a truth value of true.

5 2. Explain why the sentence “Larry likes lemon lollipops” is not a proposition.

5 3. Complete the truth table for $\neg(P \vee Q) \equiv (\neg P) \wedge (\neg Q)$.

P	Q	$\neg P$	$\neg Q$	$P \vee Q$	$\neg(P \vee Q)$	$\neg P \wedge \neg Q$	$\neg(P \vee Q) \equiv (\neg P) \wedge (\neg Q)$
T	T	F	F	T	F	F	T
T	F						
F	T						
F	F						