

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. Edit this file and append your answers using LaTeX. Be sure to fill in your name. Upload the converted pdf of your work to Canvas. This assignment is due *Saturday 28 January at 11:59 PM*. For this assignment, *neatly handwrite* your work, 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	$\neg P$	$\neg Q$	$P \vee Q$	$\neg P \wedge \neg Q$	$\neg(P \vee Q) \equiv (\neg P) \wedge (\neg Q)$
T	T	F	F	T	F	T
T	F					
F	T					
F	F					