Please complete this worksheet by **September 15th, 2021** by **11:59pm**. You do not need to upload anything to Canvas, but must mark that you completed (at least attempted) the following problems.

Once you upload a picture of your work (*here*), the solutions will become available so you can study for the weekly quizlet, which may draw one problem from this week’s worksheets.

**Problem 1**

Determine whether the following are propositions, predicates, or neither:

(a) I have a dog.
(b) Run!
(c) The next sentence – see part (d) – is true.
(d) The previous sentence – see part (c) – is false.
(e) $x$ is a multiple of 3.

**Problem 2**

Use a truth table to prove the following:

(a) $p \implies q \equiv \neg q \implies \neg p$
(b) $\neg(p \land q) \equiv \neg p \lor \neg q$
(c) $\neg(p \lor q) \equiv \neg p \land \neg q$
(d) $p \land (q \lor r) \equiv (p \land q) \lor (p \land r)$