1A Logic: Worksheet 3	5	*Excellent*	
	4	*Good*	
Your name:	3	*Satisfactory*	
Logic class (A/B/C/D/E):	2	*Weak*	
Logic class tutor:	1	*Very poor*	

Reading

Read *Introduction to Formal Logic*, Chapters 11–15.

Do the following exercises as instructed, and firmly clip/staple this question sheet – with grid correctly completed – onto the front of your work (include your work for the self-marked Section 1).

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1 Exercises from the Book

Do the following questions from the end-of-chapter exercises in *An Introduction to Formal Logic*. Then, when you have completed them, carefully check your answers against the answers available on the book's website at `www.logicmatters.net`. Correct your own work *in red*, for the marker to review. In the box below, note any residual queries or problems you have with these self-marked exercises (use a continuation sheet if you have more queries than you can mention here). Take disjunctions to be inclusive!

Exercises 13 (p. 121): Qns A3, A4, A5, A10, B1, B2, C2, C3, C6, C7.
Exercises 14 (p. 136) : Qns A7–A11, B3, B7.

Queries
Is there a continuation sheet with more queries? Yes/No

2 Further exercises

A Suppose that

> 'P' expresses *Popper is a great philosopher*.
> 'Q' expresses *Quine is a great philosopher*.
> 'R' expresses *Ramsey is a great philosopher*.
> 'S' expresses *Sellars is a great philosopher*.

translate the following into PLC as best you can.

1. Popper is a great philosopher only if Quine is one.
2. If either Ramsey or Sellars is a great philosopher, neither Quine nor Popper is.
3. Only if Popper and Quine are great philosophers is Ramsey one too.
4. Popper's being a great philosopher is a necessary condition for Quine to be one.
5. It is sufficient for Quine's being a great philosopher that either Popper or Sellars is one.
6. Ramsey and Sellars are great philosophers if and only if Quine is.
7. If and only if Ramsey is a great philosopher are Popper and Quine both great philosophers.

B Use truth-tables to test which of the following are tautologically valid.

1. $(\mathsf{P} \supset \mathsf{Q}), (\mathsf{Q} \supset \mathsf{R}), (\mathsf{R} \supset \mathsf{P}) \therefore (\mathsf{P} \equiv \mathsf{Q})$
2. $(\mathsf{P} \equiv \neg\mathsf{Q}), (\mathsf{Q} \equiv \neg\mathsf{R}) \therefore (\mathsf{P} \equiv \mathsf{R})$
3. $(\mathsf{P} \supset (\mathsf{Q} \equiv \mathsf{R})), (\mathsf{Q} \supset (\mathsf{R} \equiv \mathsf{P})) \therefore (\mathsf{R} \supset (\mathsf{P} \wedge \mathsf{Q}))$

C Which of the following are true and why?

1. If φ tautologically entails ψ and ψ tautologically entails φ then $\varphi \equiv \psi$ is tautology.
2. If φ tautologically entails ψ and φ tautologically entails $\neg\psi$, then φ is a contradiction.
3. If φ, ψ and χ are tautologically inconsistent, then $\neg\varphi$, $\neg\psi$ and $\neg\chi$ are tautologically consistent.

Question for discussion in class What is the relation between the 'if ..., then ...? of ordinary discourse and the material conditional?