

# Logic Worksheet 2

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|--------------------|------------------|
| Your name:         | Mark (out of 5): |
| Logic class (A-F): |                  |
| Logic class tutor: |                  |

Read §§6–13 of *forallx:Cambridge*, then complete the following exercises. Some exercises are marked with a ‘\*’; techniques to answer these will be covered in the lecture on the day before the worksheet is due.

## Self-marked exercises

Do the following practice exercises from *forallx:Cambridge*.

- §6 Part A
- §10 Part A
- \* §11 Part A questions 1, 3, 5, 7, 9, Part E
- \* §12 Part A questions 1, 3, 5, 7, 9
- \* §13 Parts A questions 1, 3, 5, 7, Part C questions 1, 3, 5

When you have completed these, carefully check your answers against the answers available at [www.nottub.com/forallx.shtml](http://www.nottub.com/forallx.shtml). Correct your own work *in red*, for the marker to review. In the box below, write something that you now firmly understand, as a result of doing these exercises:

|             |
|-------------|
| Understand: |
|-------------|

And in this box, write something that you want to know more about:

|                  |
|------------------|
| Want more about: |
|------------------|

## Further exercises

A. Here is a limerick by George Boolos (1995):

According to W. Quine,  
Whose views on quotation are fine,  
Boston names Boston,  
and Boston names Boston,  
But 9 doesn't designate 9.

Unfortunately, the quotation marks have gone missing from the third, fourth and fifth lines, rendering it both false and unamusing. Rectify this by adding quotation marks, to restore the proper distinction between use and mention.

B. \* Determine whether the following arguments are valid or invalid. You may use any shortcuts you like, and can use either complete or partial truth tables, as appropriate.

1.  $A \rightarrow B, B \therefore A$
2.  $L \rightarrow (L \wedge S), \neg S \therefore L \rightarrow R$
3.  $(B \leftrightarrow \neg R) \wedge \neg \neg Q \therefore \neg((B \wedge Q) \rightarrow R)$
4.  $(A \leftrightarrow \neg B) \leftrightarrow C \therefore \neg(A \leftrightarrow (B \leftrightarrow C))$
5.  $A \vee (B \wedge C) \therefore (A \vee B) \wedge (A \vee C)$
6.  $(A \wedge B) \vee (C \wedge D) \therefore (A \wedge C) \vee (B \wedge D)$