

# Solutions

## Quiz 1: Section 1.1

1. (6 points) Let  $s$  be the following statement.

If it is raining, then the ground is wet.

- (a) Find the converse of  $s$ .
- (b) Find the contrapositive of  $s$ .

(a) If the ground is wet, then it is raining.

(b) If the ground is not wet, then it is not raining.

2. (4 points) Mathematicians say that "statement  $P$  is stronger than statement  $Q$ " if  $Q$  is true whenever  $P$  is true, but not conversely. (In other words, " $P$  is stronger than  $Q$ " means that  $P \rightarrow Q$  is always true, but  $Q \rightarrow P$  is not true, in general.) Which statement is stronger?

- Manchester City is the best football team in England.
- Manchester City is the best football team in Europe.

Explain.

The second statement is stronger because England is part of Europe.

Therefore the best team in Europe must be the best team in England, <sup>if that team is in England</sup> whereas the best team in England need not be the best team in Europe (it could be a team from Germany, etc.).