

**Math 215: Introduction to Advanced Mathematics**  
Problem Set 1

**Due Friday September 7**

Do pg. 53: 2, 5

1) Construct the truth table for

$$((P \Rightarrow Q) \text{ and } (Q \Rightarrow R)) \Rightarrow (P \Rightarrow R).$$

[Note: There will be 8 possible truth assignments for  $P, Q, R$ ]

2) Consider the following statements about the real numbers  $\mathbb{R}$ . For each statement i) state the negation, ii) decide if the original statement is true, iii) state the converse and iv) decide if the converse is true. Justify your answers.

a) If both  $3 \cdot 2 = 6$  and  $4 + 4 = 8$ , then  $5^2 = 20$ .

b) If both  $3 \cdot 2 = 6$  and  $4 + 4 = 11$ , then  $5^2 = 25$ .