Assignment 1

Due Thursday, Sep 11, 2014

Note: there are 5 problems

1. Rewrite completely the argument given in the class that the product of three consecutive integers is divisible by 6.

2. Following the argument given in the class for a polynomial of degree 3, prove that any real polynomial (i.e., a polynomial with real coefficients) of odd degree has at least one real root.

3. Consider the statement, *"I think, therefore I exist"*. Is making this statement equivalent to saying, *"I do not think, therefore I do not exist"*? If not, what about the statement, *"I do not exist, therefore I do not think"*? Explain.

4. Find three integers whose sum is equal to their product. How many such triples of integers can be found? Give reasons for your answer.

5. Consider the statement:

If the area of the semicircle drawn on one side of a triangle (i.e., with this side as diameter) equals the sum of the areas of the semi-circles drawn on the other two sides, then the triangle is right angled.

(*a*) Identify and write down explicitly the context (C), premise (P) and conclusion (Q) of this statement.

(*b*) Is the statement true? Give reasons why you think it is true. (You need not formally prove it.)