**5 Math exercises:**

1. Represent implication as a combination of not, or.

2. Analyze these expressions:

a. A cat is black.

b. A cat is white.

c. A cat is not black.

d. A cat is not white.

3. Prove the following by induction:

a. $\sum\_{k=1}^{n}k^{8}=\frac{n^{9}}{9}+\frac{n^{8}}{2}+2\frac{n^{7}}{3}-7\frac{n^{5}}{15}+2\frac{n^{3}}{9}-\frac{n}{30}$

b. $\sum\_{k=1}^{n}k^{9}=\frac{n^{10}}{10}+\frac{n^{9}}{2}+3\frac{n^{8}}{4}-7\frac{n^{6}}{10}+\frac{n^{4}}{2}-3\frac{n^{2}}{20}$

c. $\sum\_{k=1}^{n}k^{10}=\frac{n^{11}}{11}+\frac{n^{10}}{2}+\frac{5n^{9}}{6}-n^{7}+n^{5}-\frac{n^{3}}{2}+5\frac{n}{66}$

4. I have 2 apples and 3 pears. In how many ways can I choose one apple and one pair? In how many ways can I choose 1 apple or 1 pair?

5. Calculate the number of all the lines linking each pair of n points.

6. Why do you personally need math?

7. Prepare to the Mid-Term Exam by revising everything you studied this semester.

**Deadline: 29.10.2014**