**MATHEMATICS LESSON 3.12.2013**

**A. EXPRESSIONS, SIMPLIFYING**

**1.** Solve  (yo s2013/exercise 1)

**2.** Express polynomial as a product of polynomials of first degree.

(yo s2013/exercise 1)

**3.**  .Define the limits

a) 

b)  (yo s2013/ exercise 12)

c) How do you find the necessary steps from calculator, if you can’t take the solution just from yous CAS-calculator?

**4.** Find the prime number factors for 95256

**5.** Solve 

**6.** a) Define the intersection point for lines  ja  .

b) Draw the lines and define the intersection point also from the graph (with calculator).

**B. PROBABILITY, NORMAL DISTRIBUTION**

**1.** Let X be the birthheight of Finnish boys. Then X is distributed normally with mean *52,0 cm*  and standard deviation *3,5 cm* , so X ~ N(52,0cm ;3,5cm).

How many percent of Finnish babyboys have height, that is

a) less than 56,0 cm

b) over 50,0 cm

c) between 50,0cm-56,0 cm

d) For how many babyboys does the birthheight differ from the mean more than 5,0 cm?

**2.** A test (for example suitability test) is distributed normally with mean 82 points and standard deviation  12 points. What kind of score should the limit be so that you could pass the test, if we want that

a) only 15 %

b) 80 %

would pass the test?

**3.** A machine, that packs sugar for packages of 1 kg, produces packages approximately the size it is adjusted to do. The machine weighs although so [inaccurately](http://www.sanakirja.org/search.php?id=317429&l2=17) that the standard deviation of the packages is 7,8 g. Anyway the weight of the packages are normally distributed.

How big packages should the machine be adjusted to produce so that the probability for the package to weigh 1000 g would be 0,90?

(So the amount of packages over 1000 g would be 90 %)

**C. DEFINING A CURVE, DERIVATIVE, TANGENT LINE AND NORMAL LINE**

**1.** Define the equation for a parabola, which can be drawn through points

(-1, 8) , (2,-1) ja (4,3) .

**2.** Define the vertex point (the ‘bottom point’) of this parabola.

**3.** Define the equation for the tangent line drawn to the point x=1/2 .

**4.** Define the equation for the normal line drawn to the point x=1/2 .

**5.** Where is the function  increasing and where is it decreasing.

Define the local minima and maxima with calculators Graph-application.