**Number theory in calculus**:

Calculating the distance D between the two points on a plane (x1, y1) and (x2, y2) is: $D=\sqrt{(x\_{1}-x\_{2})^{2}+(y\_{1}-y\_{2})^{2}}$. For the three-dimensional case, we add z.

**Functions theory in calculus**:

**Angle between two straight lines**:

For two straight lines given by the equations y = g1x + i1 and y = g2x + i2, respectively, the angle C between them can be found as $\cos(\left(C\right))= \frac{1+ g\_{1}g\_{2}}{\sqrt{1+g\_{1}^{2}}\sqrt{1+g\_{2}^{2}}}$. Substituting g1 = tanA and g2 = tanB,

$\frac{1}{(cosA)^{2}}=1+ (tanA)^{2}, \frac{1}{(cosB)^{2}}=1+ (tanB)^{2}, $we get cosC=cos(A-B)=cosAcosB+sinAsinB.

C = A – B.

**Odd and even functions**:

An even function: f(x) = f(-x). A graph of an even function is invariant with respect to its reflection in OY axis.

An odd function: f(x) = -f(-x). A graph of an odd function is invariant with respect to its 180o rotation around the origin.

Neither even nor odd function: f(x) ≠ f(-x) and f(x) ≠ -f(-x).

**Floor function** and **ceiling function** are rounding down and up, respectively.

**Translation of function** y = f(x) A units to the right and B units up is perform by the following transformation y – B = f(x – A).

**Conic sections** include ellipse, parabola and hyperbola.

The most general quadratic form, representing any conic section looks like:

Ax2 + Bxy + Cy2 + D2x + Ey + F = 0. Here A, B and C are not all zero.

D = B2 – 4AC.

If D < 0 then ellipse.

If D = 0 then parabola.

If D > 0 then hyperbola.

You identify each conic section using this criterion.

**Limit**:

A function f(x) has the limit L at the point x0 if for every ε > 0 there exist δ > 0 such that if |x – x0| < δ than |f(x) - L| < ε.

The existence of f(x0) is not needed for the existence of the limit of f(x) at x0.

We find the limits of the functions by **elimination** and **substitution**.

**Derivative**:

The next topic must be **derivative**. We will use linearity, limit and continuity to deal with derivative and **differential**.