

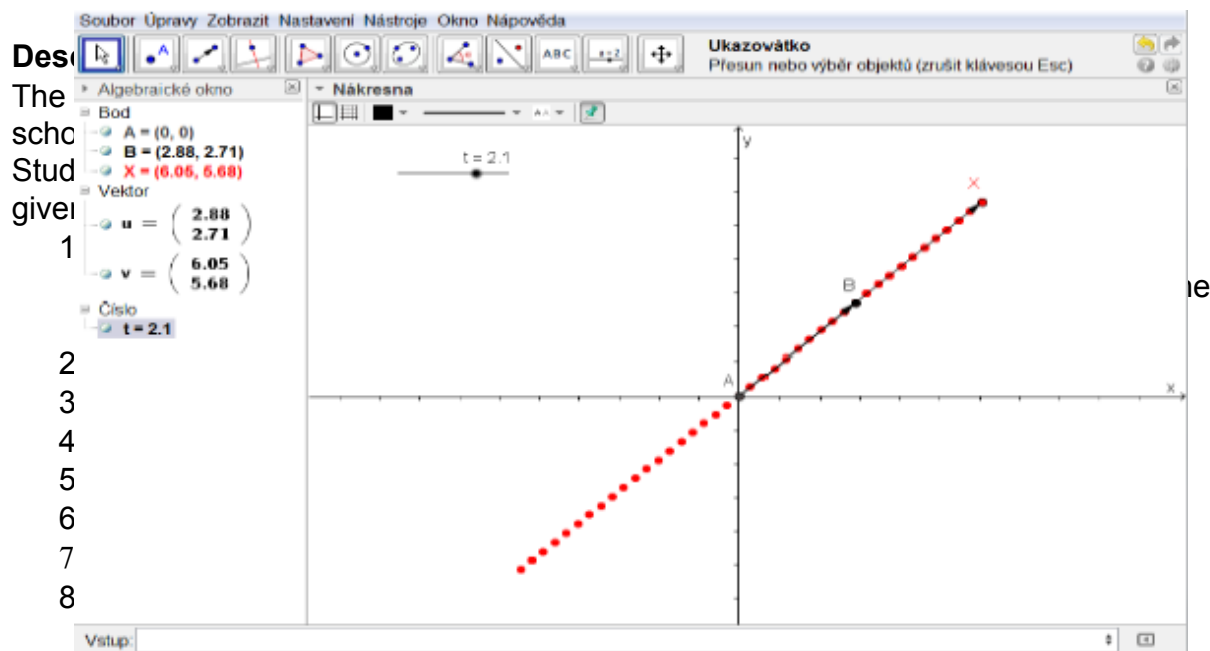
Parametric Equation of a Line

Abstract: The goal of the lesson was to derive the parametric equation of a line.

Overview

Teacher	Irena Štrausová
Period of Time	45 minutes
Type of School	grammar school
Age of Students	18 years
Number of Students/Class	30 students
Special Requirements	teacher's computer & projector, students' computers

Web address to materials <http://geogebraTube.org/student/m21762>
<http://geogebraTube.org/student/m23957>



After that the teacher started a discussion with students: How can we define this line? Is a vector enough to define a line?

Definition: Vector $u = B - A$, where A and B are two distinct points on the line, is a direction vector that describes a line segment AB.

Is this the only direction vector of the line? What about vector AX, is it also a direction vector of line AB?

Teacher derive the parametric equation for a line:

We can express vector $X - A$, where $X \in AB$, as $X - A = t(B - A) \Rightarrow X = A + tu, t \in \mathbb{R}$.

Definition: Given a point A and a nonzero vector u , equation $X = A + tu, t \in \mathbb{R}$, is called parametric equation.

Students were asked to open <http://geogebraTube.org/student/m23957>

Parametric equation can be expressed using the coordinates:

$A[a_1, a_2]$

$X[x, y]$

$u(u_1, u_2)$

$$x = a_1 + tu_1$$

$$y = a_2 + tu_2, t \in \mathbb{R}$$

The teacher assigned two points and the students were to write the parametric equation of the line going through these points.

My Experiences

I think the lesson went well and the students enjoyed it, because it was something new for them to use GeoGebra and to discover new mathematic property by their own. Some of them struggled to stay focussed on the topic and tried out all tools in GeoGebra. It is very important to instruct the students which pieces of information are crucial and should be writtten down in their notebooks.